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AN
INTRODUCTION TO LOGIC,

DESIGNED FOR

THE USE OF YOUNGER STUDENTS.

BY

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Λόγον ἔχων ἐπόμενον τῷ νοεῖν.

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PREFACE.

IT would be most presumptuous in a young writer, especially at the present time, to suppose himself capable of advocating new views in Logic, or of introducing any considerable improvement in the system established in this place. No one, however, publishes a book, without supposing that it may possibly be of some use; and the following pages were originally composed as an attempt to meet a deficiency which still exists amongst us, the want of a treatise strictly elementary, and adapted to the use of younger students, but entering sufficiently into the principles of the science, to awaken the learner's curiosity, and prepare him for a more enlarged and intellectual prosecution of the subject. Such an undertaking is obviously below the attention of the Professor; and the treatises, at present in use amongst us, appear scarcely calculated for

this purpose. That of Aldrich, addressed to an age, practically versed in the dialectic art, and familiarly acquainted with terms and modes of thought now too little understood, is necessarily obscure to an inexperienced reader; and most of his younger readers, it is to be feared, content themselves with learning his definitions by heart, without ever thinking about their meaning: on the other hand, it may perhaps be said, that for a very young mind, the elegant introduction of Abp. Whately is hardly *technical enough*. His Logic is the Logic of the nineteenth century; divested of the formality and precision of the old School; very attractive and engaging; but in his anxiety to avoid obscurity, he sometimes appears to forget the necessity of discipline. To be read with advantage, he seems to require a previous cultivation of thought seldom to be expected in those who are commencing their Logical studies in this place.

It has been attempted in the following pages to furnish an introduction to those

branches of the science which are required for the Public Examination, as familiar as was found to be consistent with accuracy. The arrangement and doctrine of Aldrich have been followed as far as the nature of a commentary, and the improvements established by later Logicians, would allow; and although, in several important particulars, a careful examination has led to deviations from his teaching, it will be found that, of these, many have been long established in this place; of the rest, the most considerable are derived from writers of acknowledged authority; and the few, which have no direct and formal precedent, either follow immediately from the former, or appeared to be mere expansions of truths implied in the text of Aldrich.

The references to Aristotle's *Organon* seemed to be required by the introductory character of the work: they have been made to the small edition of Tauchnitz, as the most convenient, and generally in use.

CONTENTS.

INTRODUCTION.

	Page
Chap. I. The proper province of Logic.	1
II. The Connexion of Logic with Language.	14
Appendix. Connexion of Language and Ideas.	20

PART I.

Chap. I. The Logical division of Simple Words.	27
II. Kinds and Classification of Predicables.	41
III. Rules of Division and Definition.	47
Appendix. Nominalism and Realism.	64

PART II.

Chap. I. Logical Division of Propositions.	73
II. Laws of Opposition and Rules of Conversion.	82

PART III.

Chap. I. Logical Division of Syllogisms.	93
II. Deductive Syllogism.	99
III. Sorites and Prosyllogism.	117
IV. Inductive Syllogism.	120
Appendix. Induction.	124
V. Practical Syllogisms. Enthymeme and Example.	140
VI. Hypothetical Syllogisms.	149

LOGIC.

INTRODUCTION.

CHAP. I.

Proper province of Logic.

OUR first enquiry in entering upon the study of Logic is the determination of its proper province, that is, of the object-matter about which it is conversant, and of its office with regard to that object-matter.

Object-matter of Logic.

The object-matter of Logic is declared by the name itself to be that faculty of the mind, which is termed in the Greek language λόγος, or *Reason*. The possession of this faculty is generally received as the characteristic property of *Man*; but it is to be remembered, that this is as much the case in relation to the superior, as to the inferior, orders of creation. Exclusively of his passions and will, there are in the mind of man

two principal instruments for the apprehension of truth, sense (*αἰσθησις*) and intellect (*νοῦς*); the former of these he shares with the brutes, the latter with purely spiritual beings; but, occupying as he does in his present condition, an intermediate position between these different orders, he is distinguished from them not more by the fact of possessing something which each respectively has not, than by the *manner in which* he possesses that which he and they partake in common.

The life, especially of the inferior animals, mainly consists in the perceptions of the sense, and these appear to be communicated generally in the way of *instinct*. The impressions which they receive from the world without are direct, immediate, without the concurrence of their own will, and therefore without possibility of improvement or deterioration; in the same manner, the nature of intellectual objects may be supposed to be presented with perfect clearness to the eye of a pure spirit; the operations of his intellect may be equally instantaneous with the perceptions of instinct, or rather are *eternal* and *fixed*: he may arrive at the truth not by successive stages, nor by carrying his thought from point to point, but at once including the whole landscape in a “stable, comprehensive, and unvarying glance.” The design of *man’s* creation, and the intention of this life as

a scene of discipline and education, has called forth in him a *third* faculty, which is properly termed that of *reflection* or *reason*. Capable of, and intended for, the society of angels, he is, in actual knowledge, at first inferior even to beasts; and must arrive at his perfection by a course of laborious exertion; truth is not forced upon him, but offered to him in an unfinished state, and before he can enjoy, he must work up the materials to their proper form. Objects, whether intellectual or sensible, are never in the first instance presented to the human mind in their true nature as *wholes*: they are, as it were, divided into parts, conveyed to him by distinct and successive impressions, through the intellect or the different senses, and his discipline consists in the perception of the *connexion* of these several impressions, and the combination of them into one idea, according to their real relations; it is this act of combination to which the name of *reason* is properly applied, and it is to be carefully distinguished from the *perception* of the separate ideas which it unites. Thus, *through the senses* we have, in immediate succession, distinct impressions of a certain colour, form, scent, &c. and are conscious of certain intellectual ideas excited by and accompanying them; *by the reason*, these separate ideas are

combined, so as to represent one object, as *rose*^a: again, we are impressed at the same time with the ideas of animality, and rationality, *through the intellect*, we observe this co-existence, and connect them into the one idea of *man*, by *reason*. It is plain, that whatever we term *objects* or *things*, are the results of similar compositions, and cannot be formed within the mind without the aid of this instrumental process; but it is equally clear, that reason, in this sense, implies imperfection, and will therefore be less and less called into action as the *mind* advances, or probably cease altogether when it has attained its highest power^b.

^a *Sensation* is the apprehension of objects conveyed to the mind immediately through the senses, as a *particular* colour, form, &c.—*perception* is the apprehension of ideas existing within the mind itself, and distinct from, though often *excited by*, and following upon, sensation. Every sensation is accompanied by such a perception, and in the idea of an object, the intellectual qualities often constitute a much more important part than the sensible; this may seem in the most familiar objects, a *chair, watch, table, church*, &c. of which a person unaccustomed to them might perceive *perfectly* the sensible qualities, without (as we say) at all knowing *what the things themselves are*. No *sensation* is false in itself: it is in the connexion of the *right perceptions* with our sensations, that the truth and falsehood of our notions, and therefore our moral discipline, chiefly consist.

^b In this way *λόγος* is usually distinguished by Aristotle as subordinate and instrumental from *νοῦς*. cf. Eth. Nic. b. vi.

Hence the faculty of reason may be indifferently defined to be, the power of connecting our ideas, or, in the words of Aldrich, “*cognitio rerum*,” the way in which we arrive at a knowledge of things.

Office of Logic in respect to Reason.

The proper office of Science is the examination of *principles*, in their twofold character, as *elements*, and *general facts or laws*: thus, the Science of Politics comprehends (1.) the analysis of a state into its constituent members, and (2.) the laws or principles according to which these are united into one body: architecture teaches (1.) the parts which make up a building, and (2.) the laws of their composition: and chemistry first resolves a physical compound into its simpler elements, and then determines the proportions in which these are combined. To this twofold use of science, human fallibility, in all practical subjects, requires the addition of a third: the most accurate analysis and determination of principles will be insufficient &c. and I. Smith’s Select Discourses. “The intuitive faculty *νοῦς* corrects the *scientific*, because by a progressive kind of analysis science *divides* the intelligible object, when *νοῦς* knows all things together in their undivided essence. Wherefore this only is immovable, and science or scientific reason is inferior to it in the knowledge of true being.” cf. also his “Way of attaining Divine Knowledge.” §. 21.

to prevent error in particular operations; and the certainty, or at least the practical value, of knowledge will be lost, unless some method is discovered of preventing mistakes, or detecting and remedying them whenever they occur. This was the office of those, which in the language of the Greek philosophy were distinguished as the *Formal*, and *Organic* or *Instrumental*, from the former which they called the *real* sciences: and in the system of Aristotle each practical or theoretical treatise is attended by its own formal auxiliary. These consist of *systems of rules*, deduced from the principles of the science, and serving as *instruments*, by the application of which we may *test* the correctness or incorrectness of any operation which we wish to examine. Thus the political philosopher, after investigating the theory of government, compiles his *code of rules or laws*, to serve as tests by which we may examine the acts of the state or of individual citizens; the architect has his *rules* of building to try the correctness of a design; the chemist his, to test the combination of physical elements; and the mental philosopher equally requires them to examine the operations of thought^c.

^c It seemed clearer to state the connexion of real and formal sciences in this order, although, as a *matter of fact*, real sciences do not *precede* formal, but the necessity of the latter

The *elements* of the reasoning faculty, and their functions, are amongst the subjects of psychology, or mental anatomy; the *principles* or *laws*, according to which their operations are performed, are included in the speculations of metaphysic; the *instrumental* science or art, which enables us to ascertain the conformity of any act of *reason* to

creates the former. All human science whatever derived its origin from human corruption; whilst the faculties of the body or mind continue unimpaired, we never think of the elements of which they are composed, or the principles according to which they perform their functions; it is only the necessity of restoring a present, or guarding against a future, violation, which leads us to these investigations. The science, for instance, of *anatomy*, or the analysis of the parts of the human body, and the discovery of that condition or constitution of its members which is requisite to health, arose entirely from the presence of *disease*. It was required to restore to energy some bodily function which had been interrupted; this could only be done by discovering the cause of that interruption, or, what in the present condition of the faculty impeded its natural exercise; the determination of this involved the discovery of the *natural state* of the faculty, or the theory of health, and this depended on the knowledge of the several faculties of the body, and their different functions, or *Anatomy*: and *universally* in all subjects it may be said, that the necessity of *rules* produced the examination of *principles*, (the sources of those rules,) and the investigation of principles led to the analysis of *elements*. Virg. Georg. i. 133.

the laws of metaphysic, is *Logic*. Hence Logic has been not inaptly defined to be, the “*formal science of the laws of thought.*” Metaphysic and Psychology are *real sciences*: they investigate the operations of thought in and for themselves: “Logic regards them only as far as they are *dirigible*, or subjects of *rules* ^c.”

Analysis of Reason.

Every system of rules, as we have said, derives its origin from human fallibility, and its principal value from the discovery and correction of *error*; it is therefore necessary for the Logician to observe, at the outset of his investigation, to what mistakes the human reason is exposed, and for this purpose to analyze it into its component parts.

The faculty of Reason comprehends three *distinct* but *progressive* operations, which are called *Simple Apprehension*, *Judgment*, and *Discourse*.

I. SIMPLE APPREHENSION.

It has been stated, that the idea of every object, is originally a collection of several perceptions. By “simple apprehension” therefore is not meant an uncompounded idea, but every act of thought, in which no comparison between two distinct objects is formally contained ^d.

^c Edinb. Review, No. cxv.

^d νόημα ἄνευ συμπλοκῆς.

α. Incomplex.

The notion or conception of one or several objects, when it determines in itself, and implies *no relation* to any other, is called *Incomplex*.

β. Complex.

When the mind is carried on from the object *immediately represented*, to others, as connected with, and standing in a certain relation to it, this is called a *Complex* apprehension.

It is evident that the “complexity” of our apprehension does not depend on the *number* of *ideas* which it contains; a conception including the *same* qualities may be *incomplex*, when it designates an object immediately and in itself; or *complex*, when it mediately connects it with others: thus “rose” is *incomplex*, because it merely denotes an object as containing certain properties; but “*a* rose” is (as we shall hereafter see) *complex*, because it, *also*, *implies* the existence of other objects, containing similar properties, and, *in that respect*, standing in a particular relation to the object immediately expressed.

2. JUDGMENT.

The succeeding act of reason, *Judgment*, (ἀπόφασις,) consists in bringing two *distinct* objects

before the mind, *formally* comparing and declaring the relation between them.

3. DISCOURSE.

Judgment is succeeded by *discourse*, (συλλογισμὸς,) the act by which we collect a new judgment, out of others in which it was virtually contained; this being the ultimate and highest act of reason, has sometimes the name “reasoning” applied to it, κατ’ ἐξοχήν.

These three operations may be familiarly illustrated by the example of scientific classification: e. g. a *conchologist*, first, observes the characteristics of individual shells; then puts together in drawers those shells which most nearly resemble each other; and those drawers which agree in certain more *general* qualities, in cabinets; then, when new specimens are brought before him, he compares them with the former, and by processes of judgment and discourse, determines to what drawer, and cabinet, they respectively belong.

The errors to which these operations of the mind are incident will be more fully explained hereafter; it is sufficient in this place to observe, that an error of *apprehension* is termed *indistinctness*, or *confusion*; of *judgment*, *falsity*; and of *discourse*, *false collection*; and that these are errors in the process of thought itself, and not

in the object of it¹. Logic, as furnishing rules for the correction of these three errors, is divided into three parts, distinct, but, like the operations which it examines, not independent of each other. It would be equally erroneous, on the one hand, to confine the term *Logic* to the rules of the *third part*, considering the other two as *merely subordinate*; (as if apprehension and judgment were not *strictly* acts of reason;) and on the other, to consider all the three parts as not distinct only, but independent. As the acts of reason are progressive, so Logic considers the *first* only in relation to the *second*, and the *second* to the *third*.

The substance of what has been said is contained in the two following corollaries.

¹ It is necessary to guard very carefully against a confusion between *logical* and *material* errors. For instance, our notions of *God* and *eternity* are sometimes represented as instances of *Indistinct apprehension*; and the proposition, *The Sun moves round the earth*, of *falsity* in Judgment. Misapprehensions of this kind inevitably lead to one of the two following results; we either forget the merely formal character of Logic, and by erecting it into a tribunal of material truth, justify the suspicion with which the study was viewed in the early ages of the Christian Church; (Eus. E. H.) or, with several modern logicians, we confine the application of the term Logic, in its strict sense, to the *third part*, and practically sanction the popular mistake which confounds “reasoning” with “argumentation.”

1. The Logician is concerned only with the intellectual forms which the mind impresses upon ideas, and not with the materials out of which they are composed. Matters of fact, the elements of thought, the Logician assumes on the authority of others; he is simply concerned with the process of thought itself. To the architect, the material of his building is nothing; the design is the same, whether it be expressed in wood, brick, or marble; he attends only to the proportions, not to the independent nature of the things proportioned. So, to the Logician, the *act of thought* is the same, whether the subject-matter be *moral, mathematical, or physical*: to contrast moral or mathematical with *logical* reasoning, is to compare poetry or prose writing with the art of composing generally.

2. As Logic does not supply the *food*, so neither does it teach the process, nor develope the principles, of thought: these are the province of other sciences: Logic supposes them known; and only furnishes means of determining the conformity or non-conformity of any particular act with them; as a moral law does not *establish* a principle of action, but enables you to determine the accordance of your own conduct with that principle *supposed known*. Hence some writers have compared Logic to a plumb-line, which

neither furnishes materials, nor gives the faculty, nor teaches the principles, of architecture; but merely ascertains the correctness of a particular building: or to a hand-rail over a bridge, which neither teaches you to walk, nor furnishes the means of crossing, but keeps you steady whilst you are doing so.

Logic therefore is defined to be “*Ars instrumentalis dirigens mentem in cognitione rerum:*” an art serving as an instrument, to keep the “mind from going wrong, whilst engaged in the process of thinking.”

CHAP. II.

CONNEXION OF LANGUAGE WITH LOGIC.

Reason, like every other faculty, can be perfected only in society. Individual observation, however careful, would be, both in extent and accuracy, a very insufficient foundation on which to construct the principles of thought; for this purpose the experience of many must concur. But thought, being immaterial, can be the object of no sense; and human minds, in the present state of existence, are not observed to exercise any immediate influence upon one another. Some other method therefore of communicating ideas becomes requisite. Accordingly Nature has established a close connexion between the internal acts of mind, and the external objects of sense, as colours, sounds, forms, and the like: and, as the minds of men are in general similarly constituted, and receive the same impressions from the same objects; the latter may be readily employed as mutual signs of the existence of the former:

thus we actually converse by music, painting, sculpture, looks, motions, &c. But all these methods are plainly inadequate to the rapid and effectual transmission of thought; they are in most cases cumbrous and awkward; capable of conveying few ideas at a time; often requiring a delicacy of perception, which ordinary persons do not possess; and above all, utterly incapable of separating a complex notion, or of distinguishing the *essential* part of an object from the accidental circumstances by which it was surrounded. But we possess in the faculty of speech or language an instrument which is almost entirely free from these disadvantages: we are endowed by nature with the power of inflecting the voice into a variety of minutely distinguished articulate sounds, which by agreement become the representatives of our *uncompounded* conceptions, and so may be infinitely modified and combined to express every succession of ideas, as the characters of the alphabet differently arranged represent every variation of the speech.

So intimate is, in matter of fact, the connexion between language and reason, that the same term, in the Greek language, is used to signify them both: with respect to the *nature* of this connexion great diversity of opinion prevails. Some philosophers appear to consider the “right use of

words" to be the adequate object of logical science; and of those who regard *ideas* as distinguished from their signs to be the object of Logic, some maintain a *natural* connexion between them, and the absolute impossibility of any act of thought, without at least an internal word; whilst others, allowing the *faculty* of speech to be a gift of nature, assert the determination of particular sounds to particular notions to be purely arbitrary, and founded only upon mutual agreement.

In order to the resolution of these questions as far as is required for our present purpose, we may observe, that the artificial instruments by which we communicate ideas may be divided into two classes: (1.) the former, called by the Greeks *ὁμοιώματα* or *μίμησεις*, are connected with the objects which they represent by a manifest *resemblance*; these are generally formed by selecting from a group of sensible, or of sensible and intellectual qualities mixed, some object of sense, either most prominent, or most readily expressed, which by natural association, suggests the rest with which it was connected: thus, painting, sculpture, music, poetry, &c., by the help of colour, form, or sound, recal the more complex objects, of which those qualities formed a part: and in all these cases the association is evidently

natural and *real*: so that a person, acquainted with the originals, cannot fail to have them recalled to him, by their artificial likenesses, as soon as they are presented to him, and without any previous communication with those by whom they are employed. (2.) *Signs* or *symbols*, the *σημεῖα* and *σύμβολα* of the Greeks, differ from the former class chiefly in the following respects; they are not perceived at *first sight* or on the *surface* to have any natural connexion with the objects which they represent; their signification is not apparent to all, nor generally to any, without *previous agreement*; and they often seem to admit modification or alteration, without injury to their use as signs.

To this latter class it is clear that language written or spoken must be referred: and Aristotle accordingly determines, that language is the *symbol* “of thought, and written characters of language: and as men’s mode of writing varies, so does their mode of speaking: although the ideas of which they are the symbols, as well as the realities of which these ideas are copies (*ὁμοιώματα*), are the same and unchangeable;” and Bishop Berkeley asserts, that words, like other signs, are “arbitrary, outward, sensible forms, having no resemblance or necessary connexion with the things they stand for and suggest.”

^a De Interp. i. §. 2. 3.

But whatever may be the *real* character of *signs*^b, it is clear that the Logician considers *words* only as the representatives of ideas: *the laws of thought* alone are the adequate objects of his science; *words* are merely the counters by which he mediately communicates, what he cannot express immediately; words stand for thoughts, as coin for real wealth, or titles and decorations for dignity and rank. No one supposes a ribbon or jewel to be the *real* presents which a prince conveys, or takes a piece of metal or paper for the real objects of transfer in commerce, although in both cases these may be the only objects perceived by the senses. In like manner the Logician is compelled to make use of Language, as much as if that alone were his end: but he *really* employs it, as the merchant does his notes, only as *the vicarious representative of his proper object—the acts of thought*. Language is therefore defined to be “*Signum rei ex instituto vicarium*,” φωνή σημαντικὴ κατὰ συνθήκην, or, “An act of thought represented by conventional articulate sounds.”

There are three Logical words, corresponding to the threefold operations of Reason. 1. The signs of simple apprehension, or simple words, and these subdivided into (α) Nouns of the *first intention*, or first notions, signs of incomplex apprehension; and (β) Nouns of the *second in-*

^b See Appendix.

tention or *second* notions, signs of complex apprehension; II. Signs of *Judicium* or *Complex words*; and III. Signs of *Discursus* or *Decomplex words*.

A *complex word* contains *three* simple words; the two objects connected, which are called the *terms*, and the sign of connexion, or copula; of *the terms*, that which is said of the other is called the *predicate*, κατηγορία: that of which it is said, is the *subject*, (ὑποκείμενον, κατηγορούμενον): a *decomplex word* contains *three complex words*.

Again, as the name of *terms* or copula is given to *simple words*, considered as *elements of complex words*; so the latter, viewed as the materials of *decomplex words*, are called *propositions*, (*proposita*, judgments *laid down* as the sources or object of proof;) and *decomplex words*, as collecting new from former propositions, are named *syllogisms*.

The relation subsisting between the three acts of thought is expressed in both these nomenclatures; the former (simple, complex, decomplex) implying the synthetical advance from apprehension to judicium and discourse; the latter (syllogism, proposition, term) resolving analytically the complete and final act into its component judgments and apprehensions.

APPENDIX TO CHAP. II.

CONNEXION OF LANGUAGE AND IDEAS.

A detailed examination of the true connexion between Language and Ideas would transcend the limits of logical enquiry, but the subject requires a general account of that theory which appears to contain the nearest approach to truth. Now when it is said that it is “impossible to think without words,” it is evident that the term “*word*” is not confined to articulate sounds or written characters, for we can certainly think without speaking or writing; but is used in a more general acceptation, including *unuttered conceptions* or *images conceived in the mind*. In this sense the assertion will imply no more than is expressed by a principle long ago allowed by Aristotle, and generally received amongst philosophers, that the mind in its present condition is incapable of a purely intellectual act, but perceives all its ideas mixed up with, and as it were shrouded in, phantasms (φαντάσματα), or images of sense. The eye of a person newly couched would be blinded by the sudden introduction of light; but the rays,

whose united blaze would destroy vision, if distilled into a grosser element, and powdered into twilight, gradually strengthen the organ, and prepare it for more perfect acts. In the same manner, the mind would be confounded, if it were suddenly brought into the presence of purely intellectual objects ; it must be content at first to perceive them faintly reflected, and half-concealed in material objects, or their images. If this be allowed, it will follow, that a *word thought* is related to a *word expressed in speech or writing*, in the same manner that an idea of beauty conceived in the mind is related to a picture, a statue, or a melody : the internal word and internal picture are both as veils through which is imperfectly revealed an idea which cannot be directly conceived ; and both differ from their external signs only, as an act of memory or imagination is distinguished from sensation.

It follows, that as every *internal word or image* bears a real resemblance to the idea which it incloses, so each “ phantasm ” is properly represented by a distinct combination of articulate sounds ; that is, that the connexion of speech and thought is derived from the original constitution of nature, and not from the arbitrary will of man. This opinion is supported by the following considerations. (1.) It is difficult on any other hypo-

thesis to account for the formation of Language at all: the use of words must either have been given by an immediate revelation; or devised by man himself to meet the exigences of his condition: on the former supposition, the question is conceded; for every connexion established by God himself, must be granted to be *real*. If man was the author of *his own* language, it seems hard to understand how we could at first have agreed, or communicated to each other our agreement, in the choice of words, unless the mind had been determined beforehand to certain sounds as the appropriate vehicles of particular thoughts. (2.) We actually allow a *real* resemblance to ideas, in the natural and artificial productions which appeal to the other senses, and, in the case of music, to the ear itself; it would be strange therefore if *articulate sounds* alone should contradict the otherwise universal analogy of Nature. (3.) To these arguments may be added the *fact*, that the analysis of all Languages shews them to have been originally derived from a common parent, and still to retain in a great degree the traces of their former identity; and widely as they have since been altered, their variations have not been generally accidental, but bear in most cases a close correspondence to the character and circumstances of the people who employ them. It will be sufficient

to refer to the Greek dialects as familiar illustrations of this fact; no one could fail to distinguish the philosophic accuracy and energy of the Attic, the coarse and unpolished strength of the Doric, and the flowing softness of the Ionian. (4.) Even those who do not formally admit the principle, unsuspectingly bear witness to its truth in a number of particular instances: we are all accustomed to speak of words as more or less *expressive*; we all believe the real difference of *style*, and the very idea of *style* is a direct assertion of the superior adaptation of particular sounds, to convey particular combinations of ideas; we are all conscious in a greater or less degree of pleasure in listening to an eloquent harangue; and the same truth is most plainly implied in the great distinctions of prose, and poetry, and their respective subdivisions according to their subjects, and the modifications of feeling which they are severally intended to represent or excite.

To this view of the subject, *three* objections may be advanced: (1.) No language is to any one intelligible without instruction; few understand foreign dialects, and the majority are comparatively ignorant even of their own. (2.) The same objects are often represented in different languages by words entirely unconnected, and often in cases when the most fanciful do not pretend to observe

any superiority in one expression over the other. (3.) The same original root may often receive various inflections in the same or cognate dialects, without any apparent change in the significancy of the term.

But the first objection may be brought, though not with equal force, against the fine arts, in which the real resemblance of the signs to the ideas which they represent, was never doubted; and it may be added, that there are persons who have a "genius for languages," *i. e.* a peculiar readiness in perceiving the adaptation of words to thoughts, as really as others possess it in colours, forms, or melody. To the second it may be answered, that to assert the *real* connexion between words and ideas, is not to assert that language in its present form adequately fulfils its original design. It was to be expected beforehand, that the fall of man in the general ruin of his faculties would impair his perception of the relation between the external and internal world, and thus diminish the efficiency of language as an organ of communication: there is, besides, in vice a natural tendency to separation, and this tendency would be increased by the daily multiplying diversities of situations and employments. The same objects are not the same to men of different tempers and pursuits; and this would be an additional reason for calling

them by different names : thus names which were originally founded in a real or at least a fancied analogy, might not be understood by those who brought to the examination of the word their own different conceptions of the object : again, the quality for which the name was given, though at the time prominent, may not be lasting ; and the name itself may be retained, when its counterpart has ceased to exist. These amongst many other reasons might be assigned for the gradual loss of the unity of language, and the impairing of its efficiency as a representative of thought. (3.) To the third objection it may be answered, that many persons are altogether deficient in the perception of the fine arts ; there are some who have no ear for music, and between these and perfect musicians, the intermediate gradations are innumerable. A man may really have a general understanding of a melody, and yet be utterly unconscious of the introduction of a discord, which would inflict exquisite pain on a person of more delicate taste ; as we in moral subjects often hold, with equal fervency, opinions really inconsistent ; in like manner it is quite possible that every inflection may impair or alter the character of a word, and this change may be unperceived by one who yet feels its general meaning.

On the whole, there seem to be probable reasons

for concluding, that in the mind of Nature, ideas and words are connected by a real resemblance, of which some traces still remain, although the corruption of man has to a great degree destroyed or weakened its completeness. In a perfect language words would be *ὁμοιώματα*, or exact copies of ideas; but we allow that in language as we actually find it, they are scarcely more than *Symbols*, in the ordinary meaning of the term.

PART I.

CHAP. I.

§. 1. *The Logical division of Simple Words.*

THE direct office of the first part of Logic is to furnish rules for the acts of simple apprehension, or simple words: but in order to the right determination of these, it is necessary previously (1) to ascertain what simple words are employed in Logic, or *the Logical division of Simple Words*; and (2) to analyze the mental process by which these are formed.

It has been stated, that Logic examines the operations of reason, in their progressive reference to each other: that, therefore, is properly the Logical division of simple words, which considers them in their relation to complex words, or Propositions. Now these, as we have seen, contain three simple words; the sign of connexion, or copula; and the two extremes or terms connected: again, of the latter (1) that which is said

of the other or predicate, and (2) that of which it is said, or subject: accordingly *terms* will be subdivided according to their *capacity* of becoming *subjects* or *predicates*, in propositions.

Those words only are *categorematic*, i. e. capable of having another said of them, or of being made subjects, which contain in themselves the notion of *independent existence*: these, as expressing *absolute being*, correspond to substantives in grammar, and are therefore termed *Logical Nouns*; and, because they represent a definite object, without the assistance of any other word, *simple terms*, *adjectives*, and other words which express *dependent* or *relative* existence, though they may be predicates, cannot alone be the subjects of any proposition, and are therefore said to be *syncategorematic*, i. e. such as cannot be subjects without the assistance of another term ^a.

Again, of *categorematic words*, some are representatives of *singular notions*, and therefore never can be predicates; others stand for *classes*, or collections of individuals, in relation to which they may be attributes or predicates.

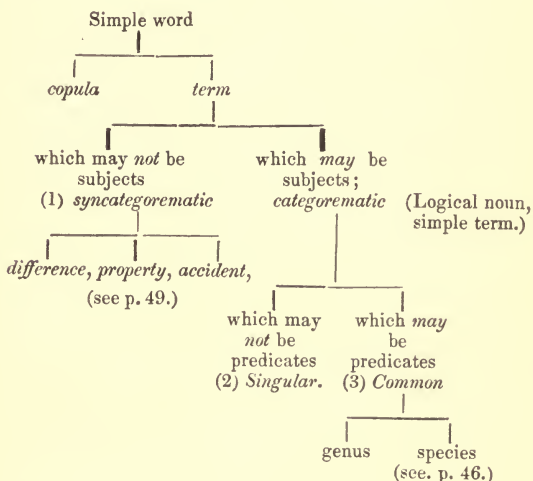
^a κατηγορεῖν, to predicate, to say one thing of another.

κατηγορία, a thing said of another,—a *predicate*.

κατηγορέημα, that of which another is said,—a *subject*.

κατηγορηματικός, that of which another may be said,—*capable of being a subject*.

So that our final division of terms comprehends (1) those which *can only be predicates* (syncategorematic); (2) those which *can only be subjects*, (singular); and (3) those which can be *both* (common.)^b



^b Ἀπάντων τῶν ὄντων (2) τὰ μὲν ἴστι τοιαῦτα ὥστε κατὰ μηδένος ἄλλου κατηγορεῖσθαι ἀληθῶς καθόλου, (οἷον Κλέων καὶ Καλλίας καὶ τὸ καθεκαστον καὶ αἰσθητόν) κατὰ δὲ τούτων ἄλλα· (καὶ γὰρ ἄνθρωπος καὶ ζῶον ἑκάτερον τούτων ἴστί·) (1) τὰ δὲ αὐτὰ μὲν κατ' ἄλλων κατηγορεῖται, κατὰ τούτων δὲ ἄλλα πρότερον οὐ κατηγορεῖται· (3) τὰ δὲ καὶ αὐτὰ ἄλλων, καὶ αὐτῶν ἕτερα, οἷον ἄνθρωπος Καλλίου, καὶ ἀνθρώπου ζῶον. ὅτι μὲν οὖν ἔνια τῶν ὄντων κατ' οὐδένος πίπτει λείγισθαι, δῆλον· τῶν γὰρ αἰσθητῶν σχεδὸν ἕκαστον ἔστι τοιοῦτον ὥστε μὴ κατηγορεῖσθαι κατὰ μηδένος, πλὴν ὡς κατὰ συμβεβηκός. φάμεν γάρ ποτε τὸ λευκὸν ἐκείνο Σωκράτην εἶναι, καὶ τὸ προσίον Καλλίαν. Anal. Pr. i. xxvii.

§. 2. *Mixed Words, &c.*

Every grammatical verb is in Logic equivalent to *two* simple words, the copula, and the predicate; as, runs, is *running*; grows, is *growing*; thinks, is *thinking*, &c. and is therefore called a *mixed word*. Of *verbs*, the following account is given by Aristotle, de Interpr. c. iii. §. 6. when a notion originally conceived as a *substantive*, is afterwards observed to exist as an *attribute* in another subject, this, being expressed by a particular inflection appended to the word, e. g. man talk-*eth*, wind blow-*eth*, produces a *verb*; which, by subsequent analysis, is resolved into the *copula*, or idea of connexion; and the attributive notion, or participle, e. g. bloweth, is *blowing*. Of these it is observed,

Copula.

(1.) That the copula *is*, or *is not*; is not the *substantive verb*, but merely expresses the *abstract notion of connexion*, (σύνθεσιν τινὰ ἢ ἄνευ τῶν συγχειμένων οὐκ ἔστι νοῆσαι): that this is true is shewn (1) by the fact, that every sentence, when exhibited in Logical form, must contain the copula; thus, “Cæsar conquered Pompey,” Logically expressed, Cæsar *is* one who conquered Pompey. “The artifice will not succeed,” is, The artifice *is* some-

thing which will not succeed; or, *is not* one which will succeed. (2) Though *every* language must contain the *idea of existence*, the copula is altogether wanting in some of the more ancient, as Hebrew and Arabic; and its use is generally rare in the earlier forms of every dialect.

Adjectives.

(2.) It has been denied that the *participle* or *adjective* can *by itself* be a predicate of any proposition; and in support of this opinion it is argued, (1) that in every *converted proposition*, what was before the predicate becomes the subject, and so must confessedly be a substantive: and (2) that it is impossible to conceive a *quality* as existing separately from the subject to which it belongs. Whenever, therefore, an adjective *appears* to be a predicate, the idea, “thing,” or “person,” is really implied; for instance, the sentence, “this house is white,” is equivalent to “this house is a *white thing*,” “my father is ill,” “my father is a *sick being*.” Now the force of the *former* argument plainly lies in the assumption, that the converse and its *exposita*, (the proposition from which it was converted,) are in effect the *same proposition*; but this is far from being the case; the new proposition is only *illative*, i. e. necessarily follows from the old without being *at all one with it*: as is plain

from the fact, that conversion is not always reciprocal; the converse cannot always be changed back again into its exposita. Again, if the second assertion be true, and we *cannot* conceive a quality distinct from its subject, then in the expression “a white man,” is implied the notion of *two objects*; “white being” and “man” in some mysterious manner united; but if it *be* possible, in simple apprehension, to conceive (as in this example) a quality distinct from, yet attached to, its subject; it must be equally possible in propositions, to assert the fact of this attachment without the introduction of a new idea.

Nevertheless we shall discover hereafter, that the predication of a quality, is quite different from the manner in which a *common noun* is referred to its subject.

Singulars.

Every predicate, whether substantive or adjective, must be *common*, i. e. must represent qualities *common to several individuals*. To this rule two apparent exceptions are furnished in the case of *Singular Nouns*; viz. (1) in a negative sentence, “Thomas, is not, John;” and (2) when the terms are, as it is called, identical, i. e. represent the *same individual*, as, “This city, is, Oxford.” But it can be shewn, that these predicates are (1) not

substantives; and (2) not confined to individuals; for (1) in all languages nouns *express* originally only a collection of qualities, and are made into substantives by the implied addition of the notion of independent existence: this, which is universally true, is clearly seen in the double use, by the Greeks and Romans, of such words as φίλος, *amicus*, and the like: thus a word, expressing qualities characteristic of an individual, may be regarded either as a *singular noun*, or as syncategorematic, as this idea of independent existence is conceived as implied or not. In both the instances before us it is plain that this notion is *not included*, and that they are therefore *not singular nouns at all*. To say "this man is Socrates," is the same thing with saying "this man *has the qualities* of Socrates," or, "this man is *philosophical*," &c. The Greeks sometimes express this distinction by the addition or subtraction of the definite article; as Ὁ Σωκράτης ἀποίχεται, — οὗτος ἐστὶ Σωκράτης. (2) The predicates in these cases are not only *adjectives*, but *common* adjectives. In the propositions, "This man is *Socrates*," "Tom is *my brother*," there is nothing, as far as *the expression* is concerned, to limit the application of *Socrates*, or *my brother*, to these particular subjects, more than in the proposition, This house is *white*, or any other sentence in which the predicate is an

adjective. Aristotle has accordingly observed, that though *there are qualities peculiar to individuals*, they cannot be predicated *as peculiar*; e. g. there is a *particular* white (τοῦ τὸ λευκὸν) in this house; but you cannot say, This house is (contains) *this white*, but *white generally*. Categ. ii. So that it is an universal rule, that predicates, whether substantives or adjectives, always express *common properties*. Ar. Categ. cap. ii. §. 1. ἀπλῶς τὰ ἄτομα καὶ ἐν ἀριθμῷ κατ' οὐδενὸς μὲν ὑποκειμένου λέγεται, ἐν ὑποκειμένῳ δὲ ἔνια οὐδὲν κωλύει εἶναι.

§. 3.

There are many other distinctions of simple words, but the greater part of them are foreign to the subject of Logic; either because they do not affect the relations of terms to each other in propositions, at least so far as to bring them under any rules; or, because they involve knowledge, which the Logician, *as a Logician*, is not supposed to possess.

This will be plain from the following examples.

1. A word signifying any certain collection of qualities is called *definite*. A word which has the particle “not” prefixed, is called *indefinite*, (*infinita*), because it only excludes certain qualities, without determinately pointing out any others.

2. A *definite word* when predicated (affirma-

tively) of any subject, is called *positive*. An *indefinite word*, if predicated of a subject which is supposed capable of possessing the quality denied, is called *privative*: if predicated of a subject, supposed incapable of the quality denied, it is *negative*; e. g. life-less would be said of a man, privatively; of a stone, negatively.

3. A word, the same in form and sound, if it be predicated of *several subjects*,

(1) *In the same sense*, i. e. to express the *same* collection of qualities, is *Univocal*.

(2) *If in different senses*, i. e. to express different collections of qualities, and these

(α) *Connected*, is *Analogous*.

(β) *Unconnected*, is *Equivocal*.

e. g. "Man" is predicated of John and Thomas, *univocally*: of Thomas, and his picture, *analogously*: of an Island and Thomas, *equivocally*^c.

An analogous or equivocal term are in reality not one, but several. This is sufficiently clear in the case of equivocals, which are merely accidental agreements in sound and spelling, resulting from the gradual modification or the compound derivation of a language: but analogous words are sometimes supposed to be *really* the same, i. e.

^c Aristotle, Categ. i. 1. applies the terms univocal and equivocal, not to the *predicates*, but to the *subjects* of which they are predicated.

“to have one meaning, though unequally applicable to its several subjects:” what this means, is not clear: if in reference to several subjects, a word expresses the *same* collection of attributes, it is not unequally applicable; if different qualities, it has not *one* meaning. The intention of this definition seems to be, that, if we first apply the word foot, for instance, to express a certain part of the human body; and *afterwards* use it to signify a proportionate part of a mountain: it is used in the second case, not properly, (οὐκ ἐπὶ ὧς) not *so strictly*, as in the former, but *metaphorically* only; but this would imply, what certainly can not be assumed, either (1) that the term expresses the *same qualities* in reference to the two objects; or (2) if it has different meanings, that the qualities said of one subject more properly belong to it than those said of the other^d. Accordingly Aristotle,

^d It is evident that these remarks must be confined to the *Logical* view of the subject: it would certainly be as erroneous to employ an *analogous* as an *equivocal* word, as a middle term in a syllogism: but to a thoughtful mind this account, by itself, will appear insufficient, and far less real and satisfactory than the incorrectly-expressed definition of Aldrich. We are tempted to imitate the enquiry of the objector in Arist. Eth. i. 4. who when it had been clearly proved to him that the word “good” means *to us* not *one thing*, but many, and that these many notions can be reduced no higher than to *ten* categories; asks, “*why* then do we call

(omitting the distinction of equivocal and analogous,) defines Univocal terms, (συνώνυμα,) ὧν

them by the *same* name? for there is clearly a real difference between them and mere *chance equivocal*s." (οὐ γὰρ ἴασι τοῖς γ' ἀπὸ τύχης ὁμωνύμοις.) The answer given in the instance of *good* seems to apply more or less to all (really) analogous nouns. A thing is good, not in itself, but because it is agreeable to the intention of God; or is conformed to the Divine mind; all good things, therefore, partake, in some manner, of the Divine Nature, which is *perfect Unity*; and do *really* agree in possessing some *one* attribute, which is the cause of their being good. What this character is, we are, in this state of being, as unable to comprehend, as we are to fathom the Divine Essence: to pretend that we can do so, is most irreverent mysticism: on the other hand, Nature has made it impossible for us not to *feel the fact*; and therefore we use analogous words, by a kind of natural divination, darkly intimating a mysterious connexion, and unity in them, which we feel, but cannot realize. It is evident, that language is almost entirely made up of analogous words, and that this is the real reason of the contingency of the principles of taste and moral action: they are, in fact, not real principles at all, but *presumptive tests* of the presence of a quality, which we know not, in its direct nature, but only in its effects; as the Sun, himself unseen, might light up a landscape, and lend a common charm to many different objects, the nature and source of which, a child, whilst he felt it, might not comprehend. Hence arises the insufficiency of many philosophical definitions, which, aiming at clearness and accuracy, are often perceived to be more incomplete than the popular meaning

ὄνομα κοινόν, καὶ ὁ λόγος ὁ κατὰ τῆς οὐσίας ὁ αὐτός· and equivocals (ὁμώνυμα) ὧν ὄνομα κοινόν, ὁ δὲ λόγος ὁ κατὰ τῆς οὐσίας ἑτέρος, i. e. which are *really distinct words*.

4. A word, expressing an idea which in its very nature makes part of a more complex object of thought; or which is so connected with a second, that the one cannot be conceived without the other, is said to be *relative to it*; the two, which together make the complete idea, are called *correlatives*, as father, and son. A word expressing an idea complete in itself, and having no necessary connexion with any other, is called *absolute*.

Some of these distinctions, however, are such as may be understood by the pure Logician; or are involved in the explanation of the second part of our subject; the process of the mind in the formation of predicables: of this kind are *contradictories*, nouns of the *first* and *second* intention, and *abstract* and *concrete* words.

Compatible, opposite, terms.

Compatible terms are such as can be predicated of the same subject.

of the word, which comprehends, without being anxious to define, all that is felt to be united in Nature.

Terms which cannot be predicated of the same subject, are called *opposite*; they are of two kinds:

1. *Words*, of which one expresses the *presence* and the other the *absence* of the same quality, and which, therefore, only differ, in one having the particle “not” prefixed to it; as, rose, not rose, white, not white, virtuous, not virtuous, are called *contradictories*; and as every attribute *either does or does not* belong to every subject, though it cannot do both at the same time; *contradictories* are defined to be, those which cannot be predicated of the same subject, but *one of which* must be predicated of every subject. Hence the opposition of contradictories is said to be *the most perfect*, and because it is the only one which involves no knowledge of the object matter, it is also the most strictly Logical.

2. *Contraries* are terms confined to a certain class of objects, and expressing the most opposite qualities *in that class*; as, virtuous, vicious, wise, foolish, &c.: contraries, therefore, are defined to be terms, which are predicable only of a certain class, and cannot be predicated of the same subject in that class; or terms which cannot be predicated of the same subject, and of many subjects neither.—A *positive* and *negative* word are opposed as contradictories; and *positive* and *privative* as contraries.

Nouns of first and second intention.

A noun of the *first intention* or *first notion* is the sign of an act of incomplex apprehension, or the conception of an object as it is in itself, and without relation to any other. A noun of the *second intention* or *second notion*, is the sign of an act of complex apprehension, or the conception of an object according to those relations which are impressed upon it by the secondary operations of the mind^e.

^e Aldrich defines a noun of the first intention, to be “*Vox in communi usu posita*,” and a noun of the second intention, “*Vox artis, quam ex communi sermone desumptam, Philosophia recudit denuo et moderatur* :” that is, a noun of the first intention, is one used in a loose and general way, or, as we say, *analogously*; a noun of the second intention expresses a definite set of qualities, and is predicated of all its subjects, *univocally*. These qualities, however, seem not to be characteristics, but properties only; a word expressing the relation of several objects to each other, must of course be definite and fixed, and cannot therefore be taken in a loose or general way; whereas one which represents objects *individually* and irrespectively of others, may be; so that it would be true to say that a noun of the second intention must always be used *univocally*; and that one of the first intention may be applied to different subjects *analogously*. But these cannot be considered as their *differentiæ*.

CHAP. II.

PREDICABLES.

Analysis of the process of mind in forming Predicables. Division of Predicables.

From the *general division* of Logical terms according to their capacity of becoming subjects or predicables in propositions, we proceed to a more particular examination of the different *Predicables* or relations in which every predicate may stand to its subject, and to the analysis of that mental process by which these several notions are evolved: the latter of these consists of two principal operations, *generalization* or *composition*, and *division*; to the former of which the acts of *abstraction* and *concretion* are subordinate.

§. 1. *Abstraction.*

An abstract word, according to Aldrich, is the sign of an idea, which in its own nature forms part of a subject, but is now conceived as separate and distinct from that subject, as, *white-ness*,

dog-ness; on the contrary, a *concrete* word, finding a notion thus independent, connects it with a subject again, e. g. *white, dog*. Now as no quality can in reality exist separately from a subject, it is plain, that every act of concretion must have been preceded by an act of abstraction, and an *abstract idea* be the first which the mind gains from any object. The process seems to be something of the following nature. When first presented to the mind, an object does not *immediately* and *of course* suggest the idea of any thing existing external to our own impressions. We are as yet only conscious of a change within ourselves, a new succession of ideas, and are entirely occupied in the examination of these, without at all considering the manner or source from which they were derived; the notion resulting from this process being, of course, hitherto regarded merely as a modification of thought, and without suspicion of its existence, separately from our own minds, is called an *abstract idea*, and the word representing it, an *abstract word*, whether derived from the senses or the intellect, or a combination of both. From the act of abstraction, which may be inconceivably rapid, we pass to the enquiry, "how we came to be affected in this manner." Now an abstract idea, like the *effect* of a landscape or work of art, does not include all the qualities ex-

isting in the object, but only those which were most adapted to awaken the attention; so that the object still continuing present, these will be repeated on a second examination, but together with others not before perceived or taken notice of. Thus the bare idea of dog-ness will be accompanied by those of a particular colour, form, size, &c. none of which, during the former process of abstraction, were considered as associated with it. The mind is thus made acquainted with the existence of ideas independently of her own perceptions, that is, of an *external object*; and the notion formerly abstract, or regarded merely as an internal act of thought, is now referred to the object without, as a quality existing in it, or becomes *concrete*. Thus man-ness, becomes *man*, just-ice, *just*, and the like. It is evident that every such concrete word is an adjective, and simply designates its subject as possessing certain qualities, without connecting it with any other, i. e. is a noun of the *first intention*.

Generalization.

There is a tendency in the human mind always to expect the recurrence of ideas in the same order which has once been observed between them. This "law of association," as it is called,

can be referred only to our innate perception of the immutability of Nature's laws, and its universality is attested by the feelings of surprise and novelty, which owe their origin to its disappointment in particular instances. From this principle it follows, that when I have once abstracted a certain group of qualities from any object, I shall always abstract the same from every other really containing them. Thus, if I have called a spaniel "dog," I shall call by the same name a mastiff, bull-dog, or Newfoundland. In this manner, the word "dog" becomes general, i. e. represents several individuals, and these, when presented to the mind, excite the same idea, or are conceived the same. Now things can only be conceived the same as identical, or as members of the same whole; and we proceed accordingly to connect the common attribute and its several subjects under the relation of a whole, and parts; the former constituted by *all*, and containing *each*, part; the latter *together* constituting and *separately* contained in the former. This final process is termed composition, or generalization; the first Logical whole or class, abstracted from individuals, is called *Species*; and since, when predicated, either of any one, or of all its subjects, it designates them not as simply possessing certain attributes, but as standing in a certain relation to each other in

respect of those attributes, it is a *noun of the second intention*.

Summum Genus.

By the same principle which led to the combination of individuals under *species*, we go on to unite several species under a higher class or *genus*; these in their turn are included under higher genera, until we arrive at a notion so abstract, as to be incapable of further analysis, viz. that of *absolute being*, or *substance*. This, as being the limit of our generalization, is called the highest or *Summum Genus*: the classes formed immediately from singulars are then distinguished as *infimæ species*^a; all between these are regarded as genera in reference to classes below, species in reference to classes above them, and are therefore called *Subaltern genera* or *species*.

Thus, by the process of generalization we are furnished with two *second notions*, under which one term may be said of another, two classes of

^a Strictly speaking, the notion of *infima species* and *individuals* are arrived at in the process of division, not generalization. Infima species being the lowest class to which we descend, and beyond which division cannot proceed; and the singular notions of which it is composed, as incapable of Logical distinction, being then called *individuals*, in contradistinction to the Classes, which are capable of analysis and distinction.

predicables, *genus* and *species*. They agree in being *categorematic*^b words, and are therefore predicated as substantive notions including or containing their subjects; or, as it is logically expressed, they are predicated in *quid*, ἐν τῷ τι ἐστὶ. They differ in this, that the *genus* is a class of classes, the *species*, properly so called, of individuals only. Hence, *Genus* is defined, that which is predicated in τι, or *quid*, of things differing in species. *Species*, That which is predicated in τι, or *quid*, of things differing in number.

3. *Differentia*.

Generalization is succeeded by the reverse process of *Division*; the analytical descent of the mind from the highest to the lowest classes, and separation of each genus into its subordinate species; this is effected by taking into account those qualities, which, forming part of the original notion of each class, were peculiar to it, and not shared in common by others. These were, of course, omitted in *generalization*, and being now, on the contrary, restored to their respective classes, they serve to distinguish from each other those which are cognate, i. e. *come immediately under the*

^b Summum genus, having no more abstract notion above itself, is an accidental exception, and never can be a subject.

same genus. We have thus arrived at a third class of predicables, which is called *differentia*, and in common with the two which follow, differs from the former in being syncategorematic, and predicated of its subject as an *adjective*, not substantive notion. It is defined, "That which is predicated in *quale quid* (ποῶν τι) of things differing in species."

4. *Property.* 5. *Accident.*

When a class is once formed, the mind never regards any individual, except in relation to his species; any quality therefore (distinct from those constituting the class) observed in him, will be thought of as attached to his class. This is confirmed by common observation; if I wished to describe a person unknown to me, I should call him "a man;" and any thing I observed in him I should refer to "man" in like manner. Thus we say, "a strangeman," "a tall man," "a clever man," &c. and so of all other classes. Hence we gain two new classes of predicables; for qualities *not forming part of the notion of a class*, may be considered in connexion with it, as *properties*, or *accidents*.

4. When a quality is observed in every member of a certain class, and that class only, it is con-

ceived as universally or necessarily, and peculiarly attached to that class, and called its *Property*. Property is defined to be, "That which belongs to that class of which it is predicated alone, and is predicated of it convertibly, but does not express the real essence of it:" or, "That which is predicated of things differing in species or number, *in quale*, and convertibly."

(5.) A quality observed in some members of a class, but not others, is conceived as attached to it, occasionally or contingently, and is called *Accident*. It is defined, "That which is predicated *in quale*, contingently, of things differing in species or number."

Thus there are *five* second notions, under which one term may be predicated of another.

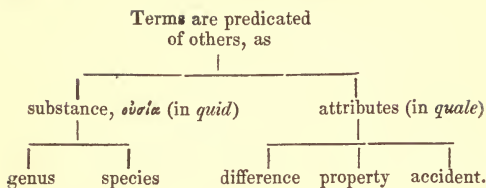
1. As a class of classes.
2. As a class of individuals.
3. As a quality forming part of a class, and distinguishing it from those cognate to it.
4. As a quality not forming part of a class, but always and peculiarly attached to it.
5. As a quality, only sometimes attached to a class.

§. 2. *Classifications of Predicables.*

They admit of a twofold classification, (1) according to *the categories*; (2) according to their relation to the *infima species*.

First classification of predicables, according to their categories.

I. All genera and species, as we have seen, are ultimately referable to the summum genus, οὐσία, substance, or independent existence. The classes subordinate to this are *predicables* in some cases only. They can not be predicates except in reference to certain classes, whilst of others they may be subjects; but the summum genus, having no more abstract notion above itself, can be the subject of none, but may be predicated of all classes whatever; hence it is called in reference to them, κατ' ἐξοχὴν, *predicate*, or *category*, and in the language of the Latin logicians, *prædicament*. In the same way, *differentia*, *property*, and *accident*, may be reduced under the common head of *attribute*, or *dependent* existence, and this being universally predicable of them is their *category*. The predicables, therefore, may be classified according to the two most abstract notions under which they respectively come, *substance*, and *attribute*. This is intended by the expression, that genus and species are predicated in *quid*; difference, property, and accident in *quale*; and it is the same thing with saying, that the former (genus and species) are *categorematic*, the latter, *syncategorematic* terms.



*Second classification of predicables, according to
their relation to the Infima Species.*

II. It has been said, that ideas confined to individuals, whether as *adjectives*, or as *singular nouns*, are incapable of being predicated in propositions. (p. 34.) Individuals, in the infinity of their number, and diversity of characteristics, cannot be comprehended by the mind, and are properly the object of no science^c, but can only be conceived in relation to those common qualities which constitute their several species. In this way we may form a new classification of predicables, as commencing with, and moving from, the class containing individuals, or infima species, the basis of predication: the others, whether substantives or attributes, being considered only as relative to it, as, (*genus*) the class including, (*differentia*) the quality distinguishing, (*property*) the quality peculiarly, or (*accident*) occasionally, attached to *the species*. Hence “infima species” is termed in

^c οὐδὲμία τέχνη σκοπεῖ τὸ κατ' ἑκάστων. Rhet. lib. i. 2.

Logic, the *whole essence*, and this apparently in a twofold respect; (1) to *individuals*, as being the intellectual form nearest to them, and the lowest under which they are known; (2) to *genus* and *differentia*, as comprehending in itself the compound notion of which they are the *separate* elements.

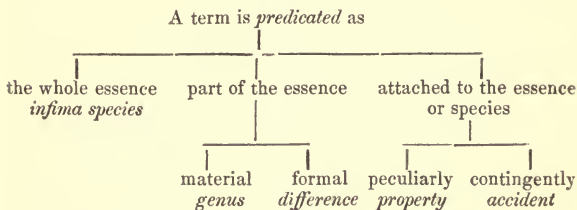
It is evident that the term *whole* is applied to *species* in reference to *genus*, in a sense different from, and inconsistent with, that in which it was employed before. A *whole*, or aggregate of distinct ideas, may be conceived either (1) as made up of parts perceived by the senses, i. e. as a physical whole; or as composed of parts perceived by the mind: and of these, (2) a compound notion may be conceived a whole in respect of the simple ideas which it *comprehends*, as man containing the *two* ideas, rational, animal, is a whole in respect of these separately; or, (3) a common attribute may be conceived a whole in respect of the subject of which it may be predicated, i. e. to which its application *extends*; e. g. *animal* is in this sense a *whole*, containing *man*, (rational animal;) and *beast*, (irrational animal.) The former of these two is distinguished as *metaphysical*, or whole of *comprehension*; the latter as *logical*, or the whole of *extension*^d. In the latter, or strictly

^d There is a fourth kind of whole, sometimes referred to

Logical acceptance, *genus* of course includes *species*; but metaphysically species may be termed the *whole essence*, as comprehending both the generic and differential notions. *Genus*, being that quality which is shared by several species, is called the *common* or *material* part; *differentia*, being peculiar to *one*, and serving to distinguish

in Logical treatises, the *Etymological*, or compound word, in relation to the etymological particles from which it is derived. This differs from the metaphysical whole in the following respect; that the elements of the latter *really represent* the separate ideas, which together make up the meaning of the word, (e. g. rational, animal, of *man*;) but the parts of the former only express the signification of the etymological elements, *before* they were combined into one word; which is very often very distinct from that which they bear in their present relation. The analysis of etymological wholes is exceedingly useful and interesting, as illustrating the metaphysical connexion of ideas; the progress of opinion or of error; antiquities, or the changes of manners, &c. But they cannot be too carefully distinguished from the metaphysical; e. g. the words *wealth* and *fortune*, which grammatically signify all *prosperity*, are now chiefly confined to the possession of *riches*; but we should be very wrong in arguing from this, that happiness *really* consists in money. Again, commerce originally signifies *buying* and *selling*; but is now used to express all intercourse. We can gather from this fact, that the intercourse of states arose from the interchange of the necessaries of life, but not that barter is actually the only or most important part of that intercourse.

it from others possessing the same generic character, is called the *formal* or *distinctive* part. On this principle is founded the following common classification of predicables.



A further subdivision is sometimes made of differentia and property into *generic* and *specific*, and of accidents, into *separable* and *inseparable*.

Differentia and property belong to classes as compared with others coming under a common genus, i. e. *as species*. A class, *as genus*, being viewed in reference to its subordinate species, is considered so far forth as *one idea*, and admits of no distinctions: but although *genus*, as such, cannot have either difference or property, every subaltern genus is also a species of a higher class, and in this character must possess them both. Now, whatever belongs to a whole class, belongs to all the members of that class; the difference, therefore, and property of a genus are predicable of its subordinate species; and are called in reference to them *generic* differences and properties, in con-

tradistinction to those qualities to which the name primarily and strictly belongs, and which are therefore termed *specific*. e. g. let "animal" be a species contained under "being," and let its difference be "sentient:" again, let animal itself contain *two subordinate species*, rational animal (man) and irrational animal (brute): the *proper* or *specific* differentia of man is "rational," but sentient the difference of its genus, *animal*, is said to be predicated of it, as a *generic difference*. This way of speaking is familiarly practised in ordinary subjects: as if a man were to ask how I know that all men *have life*, I might answer, it is the very characteristic of *their order*, i. e. to the *genus* of which man is a species: and although the original meaning of the terms, differentia and property, is in this nomenclature somewhat disregarded, there is perhaps no more accurate way of expressing the relation in which those qualities which are strictly so in reference to a higher class, are referred to its subordinates.

2. A more serious objection may be advanced against the division of *accidents* into *inseparable* and *separable*. The differentia and property of every lower class are evidently accidental to those above it, and conversely, a quality accidental to a genus, may be very essential to its subordinate species. The same analogy holds good between

the infima species and individuals. Those qualities, for instance, by which any man is distinguished from his fellow-men, and which are his *differentia*, or which without being his characteristics, are possessed by *him alone*, i. e. are his *property*, however universally attached to him, are accidental to the class of which he is a member; and have therefore been termed *inseparable* accidents, whilst those accidents which are *separable* from the individual, are called *separable* accidents. But it may be observed, that whilst the same classification is applicable to species in reference to their genera, the terms which it employs are inconsistent with themselves; for in relation to its species an accident cannot be *inseparable*; and in relation to the individual, from which it is inseparable, it is not accidental. This error, for so it must be regarded, appears to have arisen from a forgetfulness, that the Logical division of predicables terminates with the infima species; individuals, in the eye of the Logician, are considered as differing only in number; of the peculiarities, which belong to them severally, he takes no account, but views them solely as possessing those common properties, which constitute them members of their class; it is therefore enough for him to know, that a quality is accidental to their *class*; with its further relations to individual members he has absolutely no concern.

It is lastly to be observed, that it is not the province of the Logician to determine under which of these relations any two terms are connected together, *as a matter of fact*. He cannot decide, for instance, whether “attraction,” polarity, or some quality distinct from both, is rightly regarded as the differentia of the magnet. He is only required to explain the abstract meaning of these relations themselves; he must be able to distinguish the nature of a differentia, and a property; but as a Logician, he is quite incompetent to decide whether any particular quality be predicated as one or the other.

CHAP. III.

Rules of division and definition.

From what has been said, it is plain, that *generalization*, the process by which we form our classes, is not subject to the laws of Logic. Whether the act of generalization be, as is sometimes asserted, purely arbitrary, and every classification, however different, may challenge an equal right to *reality*, it is not our present object to enquire^a. Whichever way the question may be decided, the result to the Logician will be the same: for even if the *objective reality* of classes be assumed, and the obligation of the human mind, to conform itself in its generalizations to the relations established by nature; the detection of an error in this process evidently implies a knowledge of *the matter of fact*, distinct from the naked act of thought, and therefore lies beyond the sphere of Logical correction. It is not within the limits of our art to teach whether or why “man” is an infima species, whether “reason” is or is not his characteristic, or what are the genera above him.

^a See Appendix.

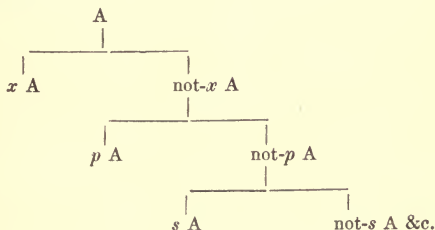
But *division*, which presupposes a previous act of generalization, is necessarily subject to Logical rules; for however free the mind may be conceived to be in her ascent from individuals to Summum genus, she is evidently obliged, in retracing her steps, to preserve the relations which she has already established. To “divide” a class, is not to create, but to *state distinctly* the species of which it *has been* constructed the genus; and unless in doing so, we assign the *exact qualities* which were selected in our generalization; if we confound properties and differences, or mingle together classes formed on different principles, we are guilty of the Logical error in simple apprehension, *indistinctness* or *confusion*. A *singular noun*, or *individual*, is, as its name imports, believed to be really an unit, and therefore in its own nature indivisible, and *infima species*, though a Logical whole cannot be divided by the Logician, on account of the infinite variety and multiplicity of the parts of which it is composed, and the consequent impossibility of finding their differentiæ; the only Logical division, therefore, is that of a *Genus* into its subordinate species.

The rules of division are the following :

- (1) The *dividing parts*, or species, must be *separately* less extensive than the *divided whole*.

- (2) The dividing parts, *together*, must be equally extensive with the divided whole.
- (3) They must be mutually opposed, i. e. their differentiæ must be mutually excluded.

Agreement with the two former rules is secured (as far is possible by the Logician) by the method of *exhaustive division*, which consists in making each successive stage of the division consist of two contradictory terms; as in the following example.



The third rule requires that the exact distinctions of the presupposed generalization shall be preserved; and that if two different classifications have been formed from the same objects, these shall not be confounded.

The physical and metaphysical whole can be predicated of their component parts *collectively* only, e. g. "tree" cannot be predicated of trunk, branches, leaves, root, *separately*, but only of them *all together*. So "man" cannot be predicated of rational, animal, except united.

The Logical whole may be predicated of its parts *individually*, (as men are animals,) as well as *collectively*, as men-and-beasts are animals; but with *this difference*, that in the former case it is conceived as *containing* or *including* its constituents, (as men *are* animals, i. e. men *come under* animals,) and is not taken in its widest extent: in the latter it is conceived as *following* from, and *constituted* by, its subject, (e. g. men and beasts are animals, i. e. men and beasts *make up* the class animals,) and *is* taken in its widest extent.

Definition.

Connected with *division* is *definition*, or the act by which we distinguish two objects of thought. Objects, in order to be distinguished from each other, must each contain *two ideas*; one in which they agree, one in which they differ: hence no definition can be given (1) of *summum genus*, or of any genus *as such*, i. e. considered in reference to its subordinate classes; (2) of *individuals*, which being regarded, as has been said, only in their relation to the infima species, have no notice taken of their peculiarities, but in the eye of the Logician, differ in number only. The objects therefore of Logical definition are *Cognate Species*.

If our common nouns could *express* the meaning of the classes which they represent, division and definition would differ only in this; that the former includes *all* the cognate species, the latter is of *one* only; but to avoid the confusion and delay which would attend the combination of *several* words to signify one object, as “rational-animal,” or sentient-living being,” &c. we substitute for them single terms, as man, animal, &c. which serve as envelopes to enfold our ideas, and render them more portable: like envelopes, however, these words conceal what they convey, and require to be unfolded, that the ideas which they contain may be *displayed*. The word “man,” for instance, does not explain its own meaning; and if I am informed that “man” and “beast” are cognate species, I have still to enquire what are the generic and common, what their distinctive qualities: to assign these respectively to each, is to *define them*; and hence definition was termed “*Oratio explicativa definiti.*”

It is subject to the following rules:—

- (1) The definition must consist of the Proximum genus, and differentia.
- (2) No *property* or *accident* must be added.

The second rule is required for the following reasons; (1) that neither property nor accident is *any part* of the class. (2) That the addition of an

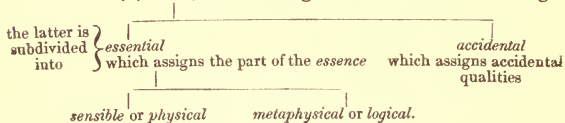
accident limits the definition to some members of the class, or to a *subordinate* species. (3) Although property is peculiar to, and convertible with, its class, yet, as it forms no part of its *notion*, the addition of it to the difference is the error which Archbishop Whately calls "*tautology*," and naturally leads to the false conclusion, that a class might exist containing the difference without the property, or the property without the difference: if α be the differentia, and β the property of the class x , and I define that class $\alpha \beta x$, it will naturally be concluded that there is a class αx which is not β , and βx which is not α^b .

^b The following classification of the different kinds of definition is given by Dr. Aldrich.

Definition is,

(1) *Nominal*, which assigns the meaning of the word.

(2) *Real*, which assigns the *nature* of the thing.

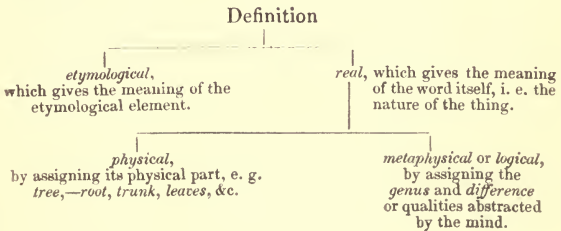


It may be objected to these,

(1) That the "meaning of the word" is what the word stands for, that is, what it really is: *nominal*, therefore, in this sense, cannot be opposed to *real*. The example of Aldrich, "*Homo, qui ex humo*," shews that he meant

etymological, which assigns the meaning *not of the word itself*, but of its *etymological particles*.

(2) By *accidental* definition, Aldrich means the definition of an *individual*, which, of course, is effected by assigning qualities accidental to the *Infima Species*. But (1) every class is defined by a quality *accidental* to the class above it; so that, in this sense, all definition might be called *accidental*. (2) The real characteristic of an individual is no more accidental to him, than the *differentia* to its species. And (3) as we cannot discover the real characteristics of *individuals*, they cannot be defined at all; but only, as it is called *described*, for *practical* purposes, by assigning qualities more or less general, according to the objects with which they are compared.



APPENDIX.

NOMINALISM AND REALISM.

The rules of Logic are not affected by the question respecting the real existence of classes : and although a subject so interesting cannot be entirely passed over in silence, it will be sufficient to give a general account of its more important features.

The principal points of opposition between the Nominalists and Realists, may be conveniently expressed in the form of two propositions, as maintained respectively by each.

The Nominalists affirm,

(1) That individual objects are the primary and only real existences, of which our genera and species are merely inadequate representations. e. g. the idea of *horse* is the inadequate conception of *some particular* horse, divested of the attendant circumstances of his colour, size, form, &c.

(2) That our classifications are entirely arbitrary :

i. e. we are at liberty to select any quality we please in objects as the basis of our generalization ; and the different classes formed from the same objects, according to the will of different persons, are all equally correct.

The Realists, on the contrary, assert,

(1) That objective forms exist, prior to, and as the causes of, individuals ; which are nothing but the manifestation of these “ forms ” to us in particular cases.

(2) That classification is in *no case* arbitrary : but we are always obliged to the discovery of those forms, in which consists the truth of things, and which are impressed upon them without any reference to our will, and by a power over which we have no control.

An attempt has been made to reconcile these conflicting theories by a third party, called *Conceptualists* ; these philosophers agree, on the one hand with the Nominalists, in holding that Individuals only have a primary and objective existence ; and, on the other, with the Realists, in maintaining that when fifty people are thinking of *triangle*, they are thinking neither of one numerical triangle, nor of fifty different ones ; but, as it is expressed, they have all in their minds the *common abstract idea* of triangle, which, it is pretended, is a real nature, distinct

from individuals, but subjective only, and having no reality separate from our own minds.

This hypothesis experiences the fate of all similar expedients, and is rejected and refuted by both parties. The Nominalist not unreasonably asks, how the reality of this one subjective idea, existing in several minds, is consistent with belief in the primary being of individuals exclusively; and the Realist with equal fairness challenges the Conceptualist to account for the perfect similarity of these abstract ideas in different minds, on any other theory than their conformity to a common objective form.

That the opinions of Aristotle tended towards Nominalism, is sufficiently evident, (1) from his assertion in the *Categories*, that Individuals are the primary and only *real* essences, (πρώται οὐσίαι, τόδε τι σημαίνουσαι,) whilst genera and species are called so only in a secondary sense (δεύτεραι οὐσίαι), and signify no real existence (τόδε τι), but only some quality in a real object (ποῖον τι): and (2) by his restriction of the notion of *truth* and *falsehood* to propositions and syllogisms, and denying the application of the term to any act of simple apprehension (νόημα ἄνευ συμπλοκῆς), de Int. cap. i. He appears, however, in this, as in other cases, to have held opinions not easily reconcileable with his own doctrine; e. g. in the *Ethic. Nic. b. vi.*

he asserts a real, immutable being in the physical world, distinct from the shifting phenomena of the senses, and not subject to any casualty. Plato, of course, asserted the opinions which we have described as those of the Realists.

Without going deeply into the metaphysical character of this discussion, it will be easy to confute the Nominalistic theory, from the following considerations.

I. The Nominalistic hypothesis cannot be maintained without the assumption of two principles, either of which is inconsistent with belief in the attributes of God: the *first* is expressed in the Latin dogma, “*Nihil esse in intellectu, quod non prius fuerit in sensu;*” that *all* ideas in the mind of man, without exception, are derived from external *material* objects, and consist either in the sensation of them, or in the memory of that sensation: the *second*, that truth is not objective, but subjective, and relative to individuals; that every man is the measure and standard of his own perceptions; and whatever *appears* to him as truth, is to him *really true*.

Of the former of these principles the falsehood is at once apparent, from the examination of the most familiar objects, a chair, a house, a table, a church, in all of which, the most important part of the notion is an intellectual idea, which no

sensation could produce. It is very common for a person, when a strange object is brought before him, to ask, "what is it?" though he has a perfect perception of its *sensible* qualities: again, of two persons, who are looking at the same picture, we might say that *one* did *not* know it, and *the other* *did*, though both might perceive the colour, form, &c. with equal distinctness; meaning, that the sensible object was connected in the mind of one with a certain intellectual idea, but not so in the mind of the other: and it is universally true, that there is no object, however simple, which is perceived immediately by the senses, or the notion of which does not include an idea, distinct from, and not attainable by, sensation. Of the second principle, that "each man is the standard of truth to himself," the necessary consequence is the denial of the government of God; of all responsible moral agency; virtue and vice; or, truth and falsehood, in the ordinary meaning of the term: for, if we suppose that God created the world, there must exist in his mind forms or exemplars according to which he created particular objects, and in conformity to which their truth consists: and we, unless we have the power of creating good and truth, independently of God, must be obliged, in our investigation of nature, to preserve those forms which He has established,

and carefully guard against any admixture of our own conceptions. To take a familiar example : a watchmaker intends to make a *watch*, or an instrument for the measurement of time, and for this purpose arranges in a particular form certain pieces of wood, metal, &c. : every body will allow that this object is *really* a watch ; so that a person who selected any qualities different from those signified by this word would have a wrong and false notion of the object, because, although really existing in it, they are not those intended by the artist himself, and do not agree with the form or pattern which was in his mind when he produced it.

II. There are many cases in which the reality of classes is so universally allowed, that a man would be considered insane who should question them, or presume to form another arrangement. Of this kind are the division of objects into animal, vegetable, and mineral ; the common subdivisions of the animal kingdom ; the distinctions of male and female ; &c. which no man supposes to be creations of his own, or dependent upon his own will. It is true that we are not able to distinguish the true classification in all cases with equal readiness and certainty ; but the fact of our doing so at all is of itself a presumption, that the analogy holds in these instances in which our

perception is deficient, as well as in those whose nature we understand.

To these arguments it is objected, that we do in matter of fact derive many different classifications from the same individuals, and that no one can call one of these more or less true than another: e. g. of the vegetable kingdom, the botanist, herbalist, agriculturist, and physician, each makes a different arrangement, and all are equally good and correct.

We answer, (1) That there *is* one classification of objects which can be shewn to be *real* in a higher sense than any other. (2) That, in no case are we the authors of our own classifications, or at liberty to frame a system according to our own pleasure.

(1) The world was created for the habitation of a being as yet sinless and uncorrupted, and was intended for the manifestation to him of the goodness and glory of its Author: the classification therefore of objects, as they were first exhibited to Adam, a being imperfect, but sinless—as containing, with more or less clearness, the resemblance of their Creator—must be considered as more direct, primary, and real, than any other.

(2) When, in consequence of his fall, man became conscious of new wants, weaknesses, and disorders, a new and secondary use was given

to certain qualities in natural objects; of contributing to the relief and restoration of his various maladies. Of this use, the first manifestation was made by an act of God himself, (Gen. iii. 24.) the rest were left for his own discovery, as the exigencies of his wants might require. From this source all trades, professions, and sciences, equally derive their origin; all are intended for the relief of some want arising from man's corruption, and all prosecute their object by the investigation of qualities with which nature with this design has endowed the several kinds of objects; and all these classifications are evidently equally true with each other. But it is to be observed, (1) that all these classifications of objects, as they necessarily imply the corruption of mankind, are secondary only, and less real than the former, which was presented to him before he sinned: and (2) that no one of these is created by man himself, nor in any way dependent on his own will. The physician, who investigates the healing properties of plants, does not invest them with those properties, nor is he at liberty to classify them according to his own pleasure; but is bound to arrange them according to the nature of the diseases which they respectively cure: and the same truth holds in all sciences.

Physical science, therefore, is clearly, in its own nature, moral; and was always so regarded in the

purser and earlier ages. This seems to be the meaning of the Egyptian mysteries, which made the pursuit of agriculture, or the arts, an occasion for the inculcation of lessons, derived from tradition, concerning the ruin and restoration of the human race: (Herod. ii. ch. 122, 123.) the authority of our Lord's parables may perhaps be adduced in confirmation of the same view: and there is no doubt that the mysteries and guilds of the middle ages prepared their apprentices for the exercise of their several arts, by previously inculcating the history of the fall of man, his consequent distress, and the appointment of particular natural objects to minister to his restoration and relief. It would be painful to enquire how much of our present infidelity and disorder may be traced to the disuse of this wise and pious custom, and the consequent separation of physical from moral truth.

PART II.

PROPOSITIONS.

CHAP. I.

DIVISION OF PROPOSITIONS.

AN act of Judgment expressed in Language is called *Proposition*, and is defined *Oratio Judicativa*, (λόγος ἀποφαντικός,) A sentence *declaring* a connexion between two terms. Ideas are connected by acts of will, or of imagination in *wishes*, *commands*, *questions*, and the like, but the *assertion* of that connexion is the peculiar province of the understanding^a.

Propositions are divided in the following manner.

Categorical, Hypothetical.

1. When one predicate is asserted of one subject, as A is B, this is called a *simple Proposition*; and because its terms are connected

^a Ἐστὶν ἅπας λόγος (oratio) μὲν σημαντικός—ἀποφαντικός δὲ οὐ πᾶς, ἀλλ' ἐν ᾧ τὸ ἀληθεύειν ἢ ψεῦδεσθαι ὑπάρχει· οὐκ ἐν ἅπασιν δὲ ὑπάρχει· οἷον ἡ εὐχὴ, λόγος μὲν, ἀλλ' οὔτε ἀληθὴς οὔτε ψευδής· οἱ μὲν οὖν ἄλλοι, ἀφίσθωσαν· ῥητορικῆς γὰρ ἡ ποιητικῆς οἰκισιότερα ἢ σκέψις· ὁ δὲ ἀποφαντικός τῆς ἰῦν θεωρίας. Ar. Interp. iv. §. 4, 5.

absolutely, and independently of any others, *categorical*^b. 2. When *several* simple propositions are so united by a copula, as to *make one assertion*, this proposition is called *Compound* (λόγος συνθετός), or, *one by connexion* (συνδεσμῶ εἶς), and because in it we assert no one of the categoricals by itself, but their dependence on each other, *Hypothetical*, or *Conditional*. e. g. “If A is B, C is D,” or, “*Either* A is B, *or* C is D:” in these instances, neither A is B, nor C is D, is asserted, but their *mutual connexion*.

Categorical propositions, with which alone we are at present concerned, are also called Propositions *de inesse*, because the predicate is supposed to be *metaphysically*, though not always logically, included in the subject. The expressions “*Inesse in subjecto*” (ἐν ὅλῳ εἶναι τῷ ὑποκειμένῳ) and *Prædicari de subjecto* (κατὰ παντὸς κατηγορεῖσθαι), are therefore indifferently used by the Logician. These propositions are subdivided in two ways; (1) according to the relation subsisting between the *subject* and *predicate*; and (2) according to their *quantity* and *quality*.

^b Aristotle never uses the word *categorical* in this sense of *absolute*; it is with him always employed in the sense of affirmative, like καταφατικὸς, (and so also sometimes the verb κατηγορεῖν, de Interpr. c. vii. §. 4.) as opposed to ἀποφατικός. See Edin. Review, No. cxv.

I. According to the relation subsisting between the terms.

1. The predicate is connected with the subject either by *Inclusion*, i. e. as part of the notion contained in it, and abstracted from it, as, *differentia*, *genus*, or *species*; or by *Juxta position*, as attached to, but not included in, it, as *property*, or *accident*. But this distinction is of little importance in Logic, and may be omitted in our classification.

2. The predicate is referred to its subject, either as an adjective, or *syncategorematic* word, (as property, accident, or differentia;) or, as a *Logical whole* or class, (species, or genus.)

(α) Again, if the predicate be a *logical whole*, it may be predicated either of *all its members*, to which it will then stand in the relation in which they are viewed by generalization, as constituted by, and *formed from*, them; e. g. *x, y, z, are all B*, i. e. *make up* the class B: (β) or *of a part of them*, according to the relation in which it is regarded by *Division*, as antecedent to, and including them, e. g. *All A is B*, i. e. *comes under B*. The former may be called an *inductive*, the latter a *deductive* proposition.

II. Each of these may again be subdivided according to their quantity and quality.

1. According^c to their *quality*, propositions are divided into *affirmative* and *negative* (καταφατικά, τι κατὰ τινός, ἀποφατικά, —τι ἀπὸ τινός): this is called the division according to quality, because it is derived from the meaning of the term “*indicativa*,” which being the *differentia* of propositions, is predicated of them “*in quale quid*,” i. e. as their essential quality.

2. According to their *quantity*, propositions are divided unto *universal* and *particular*^d.

The *subject* of a proposition may be either a *singular*, or a *common* noun; and those propositions which have a *common* noun for their subject, are either *universal*, when the subject is *distributed*, i. e. taken to stand for *all* its constituents; as, *All A is B*, *No A is B*.

Particular, when the subject is *undistributed*, i. e. taken to stand for *some* only of its constituents; as *Some A is B*, *Not-all A is B*, &c.

To these is generally added a third class, called *Indefinite*, in which the subject, being a common noun, is *in form* neither *distributed* nor *undistributed*, as *A is B*; no *sign* of universality or particularity being added to restrict or extend the

^c κατὰφασις ἔστιν, ἀπόφασις τινος κατὰ τινος
ἀπόφασις ἔστιν, ἀποφασίς τινος ἀπὸ τινος.

De Int. c. vi. §. 1. 2.

^d De Interpr. vii. §. 1. 2. 3. Anal. Pr. i. §. 1.

signification: such a proposition, it is said, must be meant either for an universal or a particular, and which of these two it is, the Logician must determine by the matter, i. e. by looking to the material connexion of the terms. If, for instance, I am informed that "islands are surrounded by water," I must decide whether *all* or *some* islands are meant, by seeing which of these two is the fact. It is plain, however, that this is incorrect, for two reasons. (1) The Logician is not called upon to decide what is the fact, but what is asserted. (2.) As a Logician, he knows nothing about the fact one way or the other: so that, if this be the proper distinction of indefinite propositions, they are only propositions imperfectly expressed, i. e. no propositions at all.

There is, however, a real opposition between particular and indefinite propositions, but it is metaphysical, and not merely formal, and therefore not recognized by the pure Logician; e. g.

If I know a certain quality to be an *accident* of a certain class, I predicate it of that class *particularly*, i. e. I affirm or deny it of certain members *to the exclusion of the rest*: e. g. *some* A is B, implying that B can be said *only* of some A, and *not of all*. In every particular proposition, therefore, the *affirmative* and *negative mutually imply each other*: if *only some* A is B, then some A is *not* B, and vice versa.

If I know that a certain quality belongs or does not belong to part of a class, but am ignorant of its connexion with the rest, I predicate this quality of the class *indefinitely*, e. i. I affirm it of some members of the class, *without necessarily excluding the others*: e. g. A is B, that is, I know some are so, but *cannot tell* whether *all* are so or not. In indefinite propositions, therefore, the negative and affirmative *do not*, as in the former case, mutually imply each other.

This distinction is evidently extra-logical; all that the Logician perceives in these two propositions is their agreement in the non-distribution of the subject; they are therefore, to him, the same, and are equally brought under his class of *particulars* or propositions which, from *whatever cause*, have their subjects undistributed.

A *singular* proposition, or one whose subject is an individual, is Logically considered as *universal*, because its subject, although not strictly distributed, is taken in its widest extent.

By combining the *quantity* and *quality*, we thus gain four kinds of propositions, *universal affirmative*, *universal negative*, *particular affirmative*, *particular negative*; which are respectively designated by the letters A, E, I, O^c.

^c It is to be observed, that every inductive proposition is universal and affirmative.

The following rules determine the distribution of their terms.

Subject.

1. *All universals*, and *no particulars*, distribute the *subject*.

Predicate.

2. A quality, or common noun, must be affirmed of every subject which possesses, or is a member of it; if a predicate, therefore, may be denied of its subject, it is evident that the two terms are mutually and entirely excluded. Hence, *All negatives* distribute the *predicate*.

3. When a quality, or common noun, is affirmed of any subject, that subject is declared to possess the one, or come under the other, without excluding the participation of any other term in these relations. e. g. If I say, "This house is white," or, "Men are animals," it does not follow that nothing is white *except* this house, or that the class animals includes *no other* species than men. Hence, an *affirmative proposition*, whose predicate is an *adjective*, or a common noun *predicated deductively*, (i. e. as including or containing its members,) *cannot distribute its predicate*.

4. In an *inductive* proposition, i. e. one in

which a Logical whole is affirmed of all its members collectively, e. g. "Men-and-beasts are (all) animals;" the predicate is viewed in relation to its subject, in the order established by generalization, as following from, constituted by, and therefore determinable by it. In these cases, therefore, the terms *will* be coextensive, and an affirmative proposition *may* have its *predicate distributed*.

Subject.

Distributed, in universals.

Undistributed, in particulars.

Predicate.

Undistributed, in *affirmatives*, whose predicate is *syncategorematic*,—or a *common* noun taken *deductively*^f.

Distributed { in negatives
 { in affirmative *inductives*.

^f To this rule an exception is sometimes made, when the terms are materially convertible. e. g. All equiangular triangles are equilateral, it being equally true that all equilateral triangles are equiangular. But it is sufficiently clear, that the truth of the second proposition is not implied in that of the first, and, consequently, that the predicate of the first is not distributed; from the fact that the mathematician is obliged to prove them by separate demonstrations.

Whatever be its material truth or falsehood, every proposition is Logically true, which conforms to these rules; and every one which does not conform to these rules, is Logically false.

CHAP. II.

§. 1. OPPOSITION AND CONVERSION.

As we considered terms only in their relation to propositions, so we regard propositions as elements of syllogisms. Now the nature of a syllogism is to deduce a third proposition from two others, in which it was virtually contained; but in many cases, and for various reasons, we exhibit propositions which do not themselves contain the conclusion, but imply others which do: and, in order to demonstrate the Logical correctness of such syllogisms, it is necessary to change these propositions into those which they imply, and, in doing this, often to transpose their terms, changing the predicate into the subject, and vice versa, i. e. to *convert* them. The province of the second part of Logic is to determine under what limitations every proposition may be converted, or, to furnish *rules of conversion*.

A converted proposition must be *illative* from its exposita; i. e. it must necessarily follow from it, without the intervention of a new term; but it is not the *same* with it, nor does it always admit of

reconversion. The only error, therefore, against which we have to guard, is the distribution of a term in the conversion, which was not distributed in the exposita, which would be assuming more in our new assertion than was implied in the former; and as many propositions have their terms unequally distributed, we cannot form our rules of conversion, without having previously determined what changes in the quantity and quality of propositions are consistent with the inference of one from the other. In order to the settlement of this question, we must ascertain in what cases propositions, having the same subject and predicate, but differing from each other in quantity or quality, *may be true together*, i. e. when they may be conceived together without contradiction. Such propositions are Logically said to be “opposed;” and to determine their relative truth and falsehood, is to determine the “*Laws of Opposition.*”

It is scarcely necessary to repeat, that the Logical truth of propositions is quite irrespective of the material connexion of their extremes, and when the laws of opposition are said to determine the relative truth of propositions, it is not meant that they enable us to pronounce on the *external* truth of *either*, but only on their *consistency or inconsistency as acts of thought*. When, for in-

stance, it is said that A and E cannot be true together, it is only asserted that the mind cannot admit them both at the same time : whether either of them, or if either, which, be materially true, it is not our province to enquire ; we have only to decide whether they are consistent with each other.

It is, therefore, wrongly objected to the laws of opposition, that they involve a knowledge of the matter, i. e. of the extra-logical connexion of the terms ; they cannot, on the contrary, be clearly and distinctly stated, unless every consideration of this kind is carefully kept out of view.

It is again objected, that though this be true, the laws of opposition, being the statement of principles and not rules, transcend the direct limits of an instrumental art, and belong more properly to Metaphysical than to Logical enquiry : this is indeed the case, but it is an inconclusive argument for the exclusion of this subject from our treatise. The laws of opposition are the principles on which the rules of conversion depend, and by which their correctness is to be tested ; and they are employed by the Logician in the same manner that a preamble containing political principles is prefixed to Acts of Parliament, which are in themselves only rules depending on those principles.

§. 2. *Laws of opposition.*

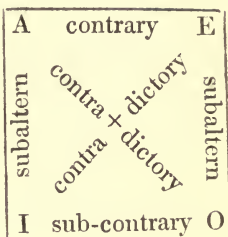
Propositions are opposed ³,

1. *In quality* ^b.

The opposition of the universal affirmative and negative is called *contrary*.

2. ⁱ That of the particulars is *sub-contrary*.

3. *In quantity*, the opposition of the particulars to their respective universals (I A, O E) is *subaltern*: the particulars are called *subalternates*, the universals *subalternants*.



§ Aristotle's doctrine of opposition differs from that of later Logicians, in being essentially founded on difference of quality, and therefore omitting the subaltern altogether, and slightly noticing the sub-contrary, in which, as he observes, there is only an apparent, or *formal*, not a *real* opposition; ἔστω τοῦτο ἀντίφασις, κατὰφασις καὶ ἀπόφασις αἱ ἀντικείμεναι· λέγω δὲ ἀντικείμεναι τὴν τοῦ αὐτοῦ κατὰ τοῦ αὐτοῦ. De Interp. iv.

^h Ἐὰν καθόλου ἀποφαίνεται τις ἐπὶ τοῦ καθόλου· ὅτι ὑπαρχει, ἢ μὴ, ἔσονται αὗται ἰναντίαι αἱ ἀποφάνσεις· λέγω δ' ἐπὶ τοῦ καθόλου ἀποφαίνεσθαι καθόλου· ὅσον πᾶς ἄνθρωπος λευκός, οὐδεὶς ἄνθρωπος λευκός—λέγω ἰναντίως ἀντίκεισθαι, τὴν τοῦ καθόλου κατὰφασιν, καὶ τὴν τοῦ καθόλου ἀπόφασιν. De Interp. vii

ⁱ Ὅταν ἐπὶ τῶν καθόλου μὲν μὴ καθόλου δὲ αὗται μὲν οὐκ εἰσιν ἰναντίαι, τὰ μὲν τοι δηλούμενα ἔστιν εἶναι πότε ἰναντία· λέγω δὲ τὸ μὴ καθόλου ἀποφαίνεσθαι ἐπὶ τῶν καθόλου· ὅσον ἔστι λευκός ἄνθρωπος,—οὐκ ἔστι λευκός ἄνθρωπος· καθόλου γὰρ ὄντος τοῦ ἄνθρωπος, οὐκ ὡς καθόλου κίχρηται τῇ ἀποφάνσει· τὸ γὰρ πᾶς, οὐ τὸ καθόλου σημαίνει, ἀλλ' ὅτι καθόλου. De Interp. vii.

4. In *quantity* and *quality*, the opposition of the universal affirmative to the particular negative (A to O), and of the universal negative to the particular affirmative (E to I), is *contradictory*^k.

(1.) An attribute cannot be conceived as at once belonging to, and excluded from, a whole class; but it may be conceived as neither belonging to all, nor yet excluded from all; i. e. A and E, *the Contraries, cannot be true together, and may be false together.*

(2.) An attribute may be conceived at once belonging to a part, and excluded from another part of the same class; but no attribute can be conceived at once neither belonging to any part, nor yet excluded from any part: hence, *Sub-contraries* (I and O) *may be true together, and cannot be false together.*

(3.) If an attribute belongs or does not belong to a whole class, it may be assumed to belong or not belong, in like manner, to any part of that class; but that which is predicated of part of a class, cannot be assumed of the whole: i. e. the *subalternates* I and O *follow respectively from the subalternants* I and E, *but A and E do not follow*

^k Ἀντικεῖσθαι λίγω. κατὰφασιν ἀποφάσει, ἀντιφατικῶς—τὴν τὸ καθόλου σημαίνουσιν τῇ τὸ οὐ καθόλου. οἷον, πᾶς ἄνθρωπος λευκός, οὐ πᾶς ἄνθρωπος λευκός· οὐδὲις ἄνθρωπος λευκός, ἔστι τις ἄνθρωπος λευκός.

from I and O: the denial of a *subalternante*, however, involves the denial of its *subalternant*.

(4.) An attribute cannot be conceived at once belonging to the whole, and excluded from a part; nor as attached to a part, and excluded from the whole, of the same class. Again, it cannot be conceived as not attached to all, and yet not excluded from a part, nor as not attached to a part, and yet not excluded from the whole. Hence, *Contradictories can neither be true nor false together, but one must be true and the other false*. For this reason, contradictory oppositions, as well as terms, (see p. 39,) is considered the most perfect¹.

¹ There is a kind of analogy between opposite terms and propositions, which seems to have occasioned the use of the same terms *contrary* and *contradictory*, as applied to them.

Opposite terms, those which cannot be predicated of the same subject;

Propositions, which cannot be true together;
are divided into

1. Contrary.

Terms,—which cannot be both predicated of the same subject, } and of many subjects
neither.

Propositions,—which cannot be true together, } and may be false
together.

2. Contradictory.

Terms,—which cannot be predicates of the same subject, } but one or other
must be predicated
of every subject.

Propositions,—which cannot be true together, } but one must be true
and the other false.

§. 3. *Rules of Conversion.*

From these relations of opposed propositions, we deduce the following *rules of Conversion*.

There are three kinds of Conversion.

1. *Simple*^m; the mere transposition of the terms without any change in quantity or quality. This can be allowed in all propositions where the terms are equally distributed; as in E, where *both* are distributed; in I, in which *both* are undistributed; and in the inductive proposition, where they are *distributed and co-extensive*.

e. g. (E) No A is B.

No B is A.

(I) Some A is B.

Some B is A.

Inductive } x, y, z are all B.
proposition } All B is x, y, z .

2. *The Conversion by Limitation or Per Accidens.*

The universal affirmative, having its predicate undistributed, can be converted only by changing the

^m 'Ανάγκη τὴν μὲν (πρότασιν) ἐν τῷ ὑπάρχειν καθόλου στερητικὴν, (E) τοῖς ὅροις ἀντιστρέφειν· οἷον, εἰ μηδεμία ἡδονὴ ἀγαθόν, οὐδ' ἀγαθὸν οὐδὲν ἔσται ἡδονή· τὴν δὲ κατηγορικὴν (A) ἀντιστρέφειν μὲν ἀναγκαῖον, οὐ μὴν καθόλου, ἀλλ' ἐν μέρει· οἷον εἰ πᾶσα ἡδονὴ ἀγαθόν, καὶ ἀγαθὸν τι εἶναι ἡδονή· τῶν δὲ ἐν μέρει, τὴν μὲν καταφατικὴν ἀντιστρέφειν ἀνάγκη κατὰ μέρος· εἰ γὰρ ἡδονὴ τις ἀγαθόν, καὶ ἀγαθὸν τι ἔσται ἡδονή· τὴν δὲ στερητικὴν οὐκ ἀναγκαῖον· οὐ γὰρ εἰ ἄνθρωπος μὴ ὑπάρχει τινὶ ζῳῷ, καὶ ζῳῷ οὐχ ὑπάρχει τινὶ ἀνθρώπῳ. Anal. Pr. I. ii.

quantity of the subject, or as it is called by *Limitation*: as *All A is B: Some B is A*. The universal negative may be converted in the same way, as *No A is B: Some B is not-A*.

3. *Conversion by Contraposition*. The particular negative O, having its subject undistributed, cannot be converted by either of these methods. Aristotle does not convert it at all; but later Logicians have adopted the method of *contraposition*; which consists in changing the *quality* of the proposition, and substituting for the old predicate, its *contradictory term*. A and E may also be converted in this manner; e. g.

O Some A is not B.

I Some A is (not-B).
Some (not-B) is A.

A All A is B.

E { All A is not (not-B).
No A is (not-B).
No (not-B) is A.

E { No A is B, or
All A is not-B.

A All A is (not-B).

I Some (not-B) is A.

§. 4. *Proof of the Rules of Conversion.*

These rules admit of the following proof, principally from the laws of opposition.

1. *Simple Conversion.*

E. If No A is B, then No B is A: this is plain from the very idea of negation, which implies the mutual exclusion of the two terms; for if some B (*as C*) be the subject of A, then, if No A is B, and All C is A, C is not-B, which is absurd.

I. If Some A is B, Some B is A; for, If I (Some A is B) be true, its contradictory E (No A is B) is false; therefore its simple converse (No B is A) is false, and its contradictory, Some B is A, (which is the simple converse of Some A is B,) true.

In the inductive proposition, the Logical whole is predicated of *all its parts* collectively; it is clear therefore, that no other except these can be predicated of it.

x, y, z , are all B.

All B is x, y, z .

For if another term p may be added, as, B is x, y, z, p , then x, y, z did not *by themselves* constitute the class B.

2. Conversion by *limitation*.

A. If All A is B, Some B is A. All A is B \therefore (its

subaltern) Some A is B \therefore its simple converse, Some B is A.

E. If No A is B, Some B is not A. No A is B \therefore (its simple converse) No B is A \therefore (its subaltern) Some B is not A.

3. Conversion by *Contraposition*, as it involves the introduction of a *new term*, cannot be immediately proved by the laws of opposition, but depends upon the relation of *contradictory terms*. These, it was found, could not both be predicated of the same subject, but one or the other must be predicated of *every subject*. Hence it follows, that if you affirm any term, you may deny its contradictory; or if you deny a term, you may affirm its contradictory, of *the same subject*; i. e. in common language, to affirm the presence of a quality, is the same thing as to deny its absence, and to deny its presence, is to affirm its absence; e. g.

O Some A is not B.

I Some A is (not-B), which is *simply convertible* into Some not-B is A.

A All A is B.

E $\left\{ \begin{array}{l} \text{All A is not (not-B).} \\ \text{No A is (not-B), which is } \textit{converted simply} \text{ into} \\ \text{No (not-B) is A.} \end{array} \right.$

E { No A is B, or
All A is not B.

A All A is (not-B), which is *accidentally converted* into

I Some (not-B) is A.

PART III.

SYLLOGISMS.

CHAP. I.

We have now arrived at the third and final act of reasoning, which is called *Discursus or Syllogism*. Every syllogism, as we have observed, is the deduction of a new proposition from others in which it was virtually contained; and is therefore naturally divisible into two parts, the proposition deduced, and that from which it was deduced; these are distinguished by the following names; (1) before the syllogism takes place, *the former* is termed the *quæstio*, or fact *to be* examined and determined; the latter, the *proof*, or method by which it is determined. (2) And when the syllogism is viewed as complete, they are respectively distinguished as *conclusion* (συμπέρασμα), and *premisses* (προτάσεις), or as *consequent* and *antecedent*; and the relation which subsists between them, and by virtue of which the former is inferred from the latter, is called their *consequentia*, or consequence.

The formal error to which the act of discursus is incident, is called *falsa collectio*, false collection, or the inference of a conclusion from premisses in which it is not really contained. It is scarcely necessary to observe in this place, that the error of “false collection” consists neither in the *falsity* of the antecedent, nor of the consequent, but in that of their *consequence*; in the *act* of inferring, not in the thing *inferred*, nor in those *from which the inference* was made, considered separately from their relation to it^a. The *Logical* correctness of the premisses is determined by the rules of the former parts; the *material* truth of the assertions which they contain, we assume upon the authority of their respective sciences; it is our appropriate province, supposing them allowed to be in all respects unexceptionable, to examine, if any, or what conclusion, can legitimately be drawn from them, and to exhibit the correctness, or expose

^a Ar. Anal. Pr. lib. i. c. 30. τὰς μὲν ἀρχὰς τὰς περὶ ἕκαστοῦ ἐμπειρίας ἔστι παραδοῦναι. Λέγω δὲ, οἷον τὴν ἀστρολογικὴν μὲν ἐμπειρίαν τῆς ἀστρολογικῆς ἐπιστήμης· ληφθέντων γὰρ ἰκανῶς τῶν φαινομένων, οὕτως εὐρέθησαν αἱ ἀστρολογικαὶ ἀποδείξεις. Ὅμοίως δὲ καὶ περὶ ἄλλων ὁποιαοῦν ἔχει τέχνην τε καὶ ἐπιστήμην. Ὡστ’ ἴαν ληφθῇ τὰ ὑπάρχοντα περὶ ἕκαστον, ἡμίτερον ἤδη, τὰς ἀποδείξεις ἐτοίμως ἐμφανίζειν· εἰ γὰρ μηδὲν κατὰ τὴν ἱστορίαν παραλειφθῇ τῶν ἀληθῶς ὑπαρχόντων τοῖς πράγμασιν, ἔχομεν περὶ παντός, εὖ μὲν ἔστιν ἀποδείξεις, ταύτην εὐρεῖν καὶ ἀποδεικνύειν· οὗ δὲ μὴ πέφυκεν ἀποδείξεις, ταύτην ποιεῖν φαιερόν.

the incorrectness, of any inference which they have been supposed to warrant.

Syllogism is therefore Logically defined “A sentence (*oratio*^b), in which certain propositions being assumed and granted as true, a new proposition necessarily follows *distinct* from, and yet *implied in*, those which are so granted.”

Syllogisms are divided first according to the nature of their premisses into *Categorical* and *Hypothetical*; the *former* (Categorical) are those which contain *only* categorical propositions; the *latter* (Hypothetical) require *one* premiss to be Hypothetical.

Hypothetical Syllogisms did not form a part of the Logical system of Aristotle; and as they depend upon principles entirely distinct and peculiar to themselves, the consideration of them may be postponed to a separate chapter.

Categorical Syllogisms are subdivided into *Inductive* (ἐπαγωγὴ) and *Deductive* (συλλογισμὸς).

^b The term *oratio*, or λόγος, in Aristotle, includes every combination of words, having a *distinct signification*, (φωνὴ σημαντικὴ κατὰ συνθήκην, ἥς τῶν μισθῶν τι σημαντικὸν ἐστὶ κεχωρισμένον· ὡς φάσις, ἀλλ’ οὐχ ὡς κατάφασις ἢ ἀπόφασις.)

^c Anal. Pr. lib. i. c. i. §. 5. Συλλογισμὸς ἔστι “λόγος ἐν ᾧ τιθέντων τινῶν, ἕτερόν τι τῶν κειμένων ἐξ ἀνάγκης συμβαίνει, τῷ ταῦτα εἶναι. (λίγω δὲ τῷ ταῦτα εἶναι, τὸ διὰ ταῦτα συμβαίνειν, τὸ δὲ διὰ ταῦτα συμβαίνειν, τὸ μηδένος ἕξωθεν ὅρον προσδεῖν πρὸς τὸ γίνεσθαι τὸ ἀναγκαῖον.)

In each of the threefold acts of the reasoning faculty, there is a correspondent and parallel subdivision into two processes, one synthetical, the other analytical: for instance, simple apprehension contains, (α) the synthetical process of generalization, by which from individuals we constitute infima species, and from infima species ascend through the various subordinate classes to the Summum Genus; and (β) division, the logical analysis by which commencing from Summum Genus we separate the higher classes into their subordinate species. Again, in the acts of judgment, the Logical whole may either be predicated (α) synthetically of all the members by which it is constituted in an inductive proposition; or it may be predicated (β) analytically of some of the members which it contains, in a deductive proposition. And, lastly, syllogisms are subdivided into the analogous classes of (α) induction, which predicates in its conclusion of a whole class, a quality previously declared in the premisses to belong or not belong to all the members which make it up: and (β) deduction, which draws a conclusion predicating of some part of a class, a quality previously declared in the premisses to belong or not belong to the whole class under which it is contained.

It is evident that generalization, inductive proposition, and inductive syllogism, agree in repre-

senting individuals as antecedent to the Logical wholes, as the primary essences, (*πρῶται οὐσίαι*), from which, by secondary operations of the mind, the species, and afterwards the genus, (as *δευτέραι οὐσίαι*), were evolved; whilst division, deductive proposition, and deductive syllogism, regard them in a truer and more philosophical relation; the genera as antecedent, and including; the individuals as subsequent, and contained under their classes. The latter operations, therefore, are in their nature superior to the former, which belong to an earlier and more ignorant condition of thought, and express the relation of objects as they appear to our first perceptions, not as they are afterwards viewed by our mature and experienced reflection. Hence they are, in Logic, considered as subordinate, and as chiefly, if not only, useful in enabling us to realize the latter.

It might therefore be expected that in a Logical treatise, the rules of Induction should precede those of Deduction: but there are several reasons which make it more convenient to follow the order generally adopted, of placing the deductive syllogism first. The latter, indeed, as the more perfect and superior, may, in some respects, be regarded as a more *real* species of reasoning; and as the former is chiefly required to supply the elements of the latter, it is necessary to be acquainted with the constituents and laws of a de-

ductive syllogism, before we have recourse to induction for that part of them which it contributes: besides, we shall hereafter find, that the power of forming *our own* inductions, is itself the result of a series of deductive reasonings, derived from principles depending upon the authority of *others*; so that deduction occupies the *lowest*, as well as the *highest* place in our mental education^d. When to these considerations is added the fondness of the human mind for positive and systematic knowledge, and its natural impatience and dislike of all which tends to remind it of its own imperfection, it will not appear surprising that deduction should have generally engaged, even too exclusively, the attention of Logical writers^e, and have secured a prominence in their treatises, which occasioned first the neglect, and afterwards almost the loss, of the true principles and value of induction; or, that Aristotle himself should, in some measure, appear at least to sanction this partiality^f. Whilst, however, we are careful in preserving to Induction its proper share of attention, the considerations which have been mentioned constitute a sufficient sanction for continuing to Deduction its usual priority in order.

^d Ar. Eth. Nic. vi. (ἐπιστήμη.) ^e Ar. Rhet. l. ii.

^f This is apparent from his use of the generic word συλλογισμὸς to designate *deductive* reasoning exclusively.

CHAP. II.

§. 1. *Deductive Syllogisms.*

Every syllogism is accounted *valid* (δυνατὸς) in which the conclusion is deducible from the premisses, without requiring the intervention of a new *term*; but the force of the inference is not *equally apparent* in all forms of argumentation. When the propositions are so arranged that the Logical truth of the conclusion is evident *at once* from the mere force of the expression, the syllogism is called *perfect*^a; and the correctness of all deductive reasoning ultimately depends upon its capability of being exhibited in this *perfect form*, in which alone the conclusion *directly* follows from the premisses *as actually stated*. Every deductive syllogism, when regularly exhibited in this perfect form, is found to predicate in its conclusion of certain members of a class, a quality, which in the premisses has been previously predicated of the whole class under which they are contained; and the Universal Principle, on its conformity or non-

^a Anal. Pr. lib. i. cap. i. §. 7. Τέλειον καλῶ συλλογισμόν, τὸν μηδὲν ἄλλου προσδιδόμενον πρὸς τὸ φανῆναι τὸ ἀναγκαῖον.

conformity to which the validity of all Deduction depends, is stated in the following terms by Aristotle, in his celebrated “Dictum de Omni et Nullo.” *Whatever is predicated affirmatively (de omni) or negatively (de nullo) of a whole class, may be predicated accordingly (affirmatively, or negatively) of any member of that class.*

§. 2. Canons.

Of this Universal Principle every *perfect syllogism* is a direct and immediate example; but there are many *valid* forms of argument in which this is not the case; in which the conclusion follows *indirectly* from its premisses, and cannot be exhibited in a perfect form without the transposition or conversion of the propositions^b. Of course the correctness of all such imperfect or indirect syllogisms, ultimately depends on their conformity to the dictum, and their Logical accuracy cannot be clearly exhibited, except by reducing them into a form in which this conformity is directly visible. But it has been also observed, that all valid syllogisms whatever, indirect as well as direct, agree in the possession of certain common qualities, and all which have not these qualities, are incapable

^b Anal. Pr. lib. i. cap. i. §. 7. Ἀτελῆ καλῶ συλλογισμὸν τὸν προσδεόμενον ἢ ἐνὸς ἢ πλείονων, (πρὸς τὸ φανῆναι τὸ ἀναγκαῖον) ὃ ἔστι μὲν ἀναγκαῖα διὰ τῶν ὑποκειμένων ὅρων οὐ μὲν εἴληπαι διὰ προτάσεων.

of reduction. These, therefore, may be considered as the *properties* of reducible syllogisms, and have accordingly been made the foundation of *the two following canons*, which are designed as tests of valid reasoning, *immediately applicable in all cases*. It is to be observed, however, by way of caution, that these canons are not intended to *supersede* the authority of the “dictum,” nor to be set up together with it as principles of reasoning. They are related to it in the same manner as the general consent of mankind is related to the cause of moral truth, not as exhibiting or containing it, but as furnishing the best presumptive test of its existence, where it is not immediately perceived.

1. When two terms agree, i. e. are affirmatively connected with one and the same term, they agree, i. e. are affirmatively connected with each other.

2. When of two terms, one agrees, or is connected affirmatively, and the other disagrees, or is negatively connected with one and the same third term, they disagree, or are connected negatively with each other.

A syllogism, direct or indirect, to which one of these two canons cannot be immediately applied, is at once pronounced invalid.

§. 3. *General Rules.*

By the help of the foregoing canons we are enabled to construct the following *general rules* of syllogisms; which admit of a three-fold division; *the first* section containing the number and distinction of the elements of which syllogisms are composed; and the other two, the rules of those elements, viz. *the second*, the rules of the terms, and *the third*, the rules of the propositions.

I. *Of the Elements of Syllogism.*

1. Every syllogism consists of *three terms*; *the two extremes*, the nature of whose connexion it is the object of syllogism to determine; and *the third* term, with which each is separately compared, in order to ascertain that connexion. Of the extremes, that which is predicated of the other, is called the *Major Term*, and its subject, *the Minor*: the third term, with which they are compared, is called the *Middle*, (or, in Latin Logic, *Argumentum*, as being that term on which the validity of the reasoning principally depends.) The meaning of these names is explained by a reference to the direct syllogisms; in which the Major Term is always the *most extensive*, and the Minor the *least extensive*, of the three; and the

Middle, a class less extensive than the Major, and *more so* than the Minor^c.

2. Every syllogism contains three propositions: the *conclusion*, in which the two extremes are brought together: the *major premiss*, in which the major term is previously compared with the middle: and the *minor premiss*, in which the minor term is compared with the middle.

Note. In a perfect syllogism, the *major premiss* is an universal fact, and is therefore sometimes called *Propositio*, as containing a statement generally allowed; the minor premiss, being always *less general* than the major, and sometimes an *individual fact*, is less open to general observation, and therefore called *Assumptio*.

II. Rules of the Terms.

3. The *middle term* appears in both of the premisses, and must be distributed in them, *once at least*: for if the middle term in each premiss is undistributed, i. e. stands only for part of its constituents, we cannot be sure that the two extremes have been compared with the same part of it, and it may therefore be really two distinct terms.

^c Καλῶ μέσον μὲν, ὃ καὶ αὐτὸ ἐν ἄλλῳ, καὶ ἄλλο ἐν τούτῳ ἐστίν· ἄπρα δὲ, τὸ αὐτό τι ἐν ἄλλῳ ὄν, καὶ, ἐν ᾧ ἄλλο ἐστίν. Ar. Anal. Pr. cap. iv.

Note. In a perfect syllogism, the middle is never distributed more than *once*, and in the major premiss.

4. The major and minor term only appear in the conclusion; and neither of them may be distributed, unless it has been previously distributed in its premiss: the violation of this rule, in either case, is called an *Illicit process* (or advance in signification) of the major or minor term: thus

All A is B.

No A is C.

No C is B, illicit process of major.

III. *Rules of the Propositions.*

5. From two negative premisses no conclusion can be drawn, for of course from the mere fact of the exclusion of a common idea from two others, we are not warranted in inferring any connexion, affirmative or negative, between those ideas themselves, and accordingly the canons require that *one* term at least should *agree* with the middle.

6. If one premiss be negative, the conclusion is negative.

7. If the conclusion be negative, one premiss must be negative. These rules follow immediately from the canons, which require for the proof of the disagreement of two terms, that one should agree, and the other disagree, with the middle.

8. From two particular premisses no conclusion can be drawn: for you will either have two negative premisses (O O), or the middle term undistributed (I I), or an illicit process of the *major term* (O I).

9. If one premiss be particular, the conclusion will be particular. For the particular premiss may be either O, or I. (1) If it be I, the other may be A, or E. Now in A I one term only is distributed, which of course (rule 3) is the middle; and the conclusion therefore is *I*: in E I, *two terms* are distributed, of which one is the middle; one only therefore can be distributed in the conclusion, and this, since the conclusion is *negative* (rule 6), must be the *predicate*. (2) If the particular premiss be O, the other can only be A: here again there will be only two terms distributed in the premisses, one of which is of course the middle, and the other, for the same reason as in the former example, the *predicate* of the conclusion.

10. Two universal premisses do not necessarily infer an universal conclusion.

Note. This rule does not extend to perfect syllogisms; although in these, of course, you *may* infer a particular from universal premisses, if you please.

§. 4. *Moods.*

From the consideration of syllogisms generally,

we proceed to the subdivision of them according to their *Moods* and *Figures*.

1. By the *Mood* of a syllogism is meant the designation in their order of the quantity and quality of the propositions of which it is composed: thus A E O represents a syllogism, of which the major premiss is an universal affirmative, the minor, an universal negative, and the conclusion, a particular negative; the major premiss is for the sake of distinctness generally placed first in order, the minor second, and the conclusion, last: although that which really *constitutes* the major and minor premisses, and which is their unfailing test, is their containing respectively the predicate and subject of the conclusion.

As there are four propositions which can enter into deductive syllogisms, (A, E, I, O,) and three of these in every syllogism, there are sixty-four conceivable moods. For there may be four major premisses, each of these may have four different minors, and of these sixteen pairs of premisses, each may have four conclusions. Of these sixty-four, however, the great majority, when tested by the general rules, are found to be inadmissible: for instance, AIA, is rejected for an universal conclusion from a particular premiss;—OAI, for an affirmative conclusion from a negative premiss;

—IEO, for an illicit process of the major term, &c. and upon examination it is proved, that the following eleven moods only can be lawfully employed in syllogism; AAA, AAI, AEE, AEO, AII, AOO—EAE, EAO, EIO—IAI—OAO.

§. 5. *Figures.*

The *figure* of syllogism depends upon the position which the middle term occupies in the premisses with regard to the major and minor; and as this position may be varied in four different ways, there are consequently *four figures*. In the *first figure*, the middle term is the subject of the major premiss, and predicate of the minor: in the *second*, the predicate of both: in the *third*, the subject of both: and in the *fourth*, which is the exact converse of the first, it is the predicate of the major, and subject of the minor, premiss.

Fig. 1.	Fig. 2.	Fig. 3.	Fig. 4.
B A	A B	B A	A B
C B	C B	B C	B C
C A	C A	C A	C A

When the eleven moods are applied respectively to these figures, it will be found that each figure rejects *five*; so that *twenty-four only* remain admissible, *six* in each figure: of these twenty-four again it is found, that five deduce a particular conclusion from premisses, which in the

same figure warrant an universal; these, therefore, although valid, are neglected as practically useless, and the remaining nineteen alone retained as of any real value. To express these, the Schoolmen have invented the following memorial lines, in which the *vowels* designate the *mood*, and the *consonants*, beside their other uses which will be specified hereafter, serve to distinguish from one another the syllogisms which have the *same mood* in different figures.

Fig. 1.

bArbArA, cElArEnt, dArII, fErIOque prioris:

Fig. 2.

cEsArE, cAmEstrEs, fEstInO, bArOkO,
secundæ:

Fig. 3.

Tertia, dArAptI, dIsAmIs, dAtIsI, fElAptOn,
bOkArdO, ErIsOn habet: quarta insuper
addit.

Fig. 4.

brAmAntIp, cAmEnEs, dImArIs, fEsApO,
frEsIsOn.

By an accurate observation of these mnemonic lines it will be apparent, that the several figures possess certain peculiarities, which are embodied in the following *special rules*.

In the first figure.

The major premiss must be universal :

The minor premiss must be affirmative, *and deductive*, i. e. having for its predicate a class-word, considered as *containing* its constituents.

In the second figure.

The major premiss must be universal :

One premiss must be negative : and therefore

The conclusion must be negative.

In the third figure.

The minor premiss must be affirmative,

The conclusion, particular.

In the fourth figure.

The major and minor premisses may be any proposition except O, and the conclusion, any proposition except A.

All these special rules will be easily explained and proved by a reference to the *general rules* detailed above: for instance, in the first figure, *the minor premiss must be affirmative*: for if it were negative, the major premiss must be affirmative; therefore the major term (being its predicate) will be undistributed: but the conclusion must be negative: therefore its predicate, again the major term, will be distributed: therefore there will be an illicit process of the major term. Again, in the *second figure*, *one premiss must be*

negative; otherwise, the middle term, being the predicate of two affirmative propositions, would be undistributed; and in the *third*, the *minor premiss must be affirmative*; for if it were negative, the major premiss must be affirmative, and therefore the major term, undistributed; but the conclusion will be negative, and therefore distribute its predicate, the major term, which will thus suffer an *illicit process*.

It will be further observed, that the moods of the *first figure* are the only ones to which the “Dictum de Omni et Nullo” will immediately apply; and are therefore the only perfect or direct forms of deductive reasoning: as being most perfect, they are also generally the forms into which syllogisms most readily fall: but there are certain cases in which it is both more convenient and natural to employ the second or third figure.

1. If you wish to *disprove an affirmative* proposition maintained by your adversary, you will probably argue in the *second* figure, by shewing that the terms in question cannot be affirmatively connected, because one possesses a quality or is referred to a class, which the other does not possess, or does not belong to.

2. If you wish to establish a *particular objection* to an *universal proposition* of your adversary, your reasoning will naturally assume the form of the

third figure, shewing either that it is impossible to deny the connexion of the terms in *all cases*, as they can both be referred to the same subject; or that it is wrong to affirm it *universally*, inasmuch as one can be referred to a subject to which the other cannot: for this reason, the third figure has been called by Abp. Whately, the *Enstatic* figure.

This remark does not extend to the *fourth* figure, which is, on all occasions, perfectly useless; and in fact a mere perversion of the first, never employed except from awkwardness or inadvertence. The terms, indeed, are so arranged as to produce the utmost confusion and absurdity; for the middle being said of the major, and the minor of the middle, and, lastly, the major of the minor, the major is, in consequence, said of itself: or again, the major is said of the minor, and the minor of the middle, therefore the major may be said of the middle; but the middle is said of the major, and thus of itself: for this reason Aristotle confines himself entirely to the first three figures, and never adverts to the fourth as an allowable mode of argumentation; and later Logicians, although they have introduced it as containing one of the *possible* positions in which the middle term may be placed, have never omitted to add a caution with respect to its perfect inutility.

§. 6. *Reduction.*

It has been observed, that the moods of the first figure are the only ones to which the dictum immediately applies; all other figures are therefore indirect or imperfect; and as the validity of all deductive reasoning depends ultimately upon the dictum; they can only be proved to be correct by *reducing them*, (as it is called,) i. e. making such alterations in the distribution and position of the terms, as shall exhibit the syllogism in one of the moods of the first figure.

You may exhibit the correctness of a conclusion in the first figure, either by *directly proving* itself, or a proposition from which it is illatively convertible; or by shewing its *contradictory to be false*; and hence arise two kinds of reduction; the *direct* or *Ostensive*, and *indirect* or *Reduction per Impossibile*.

Ostensive Reduction.

Ostensive Reduction consists in proving in the first figure the old conclusion, or one from which it is illatively convertible, by the simple transposition of the premisses, or such changes of the quantity and quality and position of the terms, as are warranted by the laws of Conversion; e. g. an argument in Camestres may be reduced to Cela-

rent, by the transposition of the premisses, and simple conversion of the minor premiss and conclusion.

<i>cAm</i>	All A is B.	No B is C.	<i>cE</i>
<i>Es</i>	No C is B.	All A is B.	<i>lA</i>
<i>trEs</i>	No C is A.	No A is C.	<i>rEnt</i>
∴ No C is A.			

Reduction per impossibile.

Reduction per impossibile consists in substituting the contradictory of the conclusion for one of the premisses; this, with the remaining premiss, will have for their conclusion the contradictory of the *premiss suppressed*: but as the former premisses were granted as true, our new conclusion must be false; and the process of reasoning being supposed correct, one of the premisses from which it follows must be false: this cannot, of course, be that one which belonged to the former syllogism, but is necessarily the new proposition, or contradictory of the old conclusion; which, by the laws of contradictory propositions, is consequently true: e. g. Baroko, may be reduced to Barbara, per impossibile, in the following manner.

<i>bA</i>	All A is B.	<i>bAr</i>	All A is B.
<i>rOk</i>	Some C is not B.	<i>bA</i>	All C is A.
<i>O</i>	Some C is not A.	<i>rA</i>	All C is B, &c.

It is evident that the opposition of *contradictories* only can be employed in this kind of Reduction; as the falsehood of one *contrary* does not imply the truth of the other.

All imperfect syllogisms can be reduced by one or other of these methods to the perfect form of the first figure; and the process most conveniently applicable in each instance has been expressed by the Schoolmen in the memorial lines which have been quoted above. In these lines, as has been said, the vowels represent the quantity and quality of the propositions; the consonants B, C, D, F, with one of which every word begins, denote the mood of the first figure to which it is to be reduced; M, indicates the transposition of the premisses; S and P respectively, the simple and accidental conversion of the proposition represented by the vowel immediately preceding; and K, the reduction per impossibile, by the substitution of the contradictory of the conclusion for the premiss after which it is placed. Thus, Baroko will be reduced to Barbara, by substituting the contradictory of the conclusion for the minor premiss; and Disamis to Darii, by the transposition of the premiss, and the simple conversion of the major and conclusion.

In the mood Bramantip, P signifies that the conclusion of the syllogism, when reduced, will

be universal, and must therefore be converted by limitation.

Reduction of Baroko and Bokardo.

All the imperfect moods may be reduced per impossibile, and nearly all ostensively; the only exceptions are furnished by the moods Baroko and Bokardo; which would require for ostensive reduction the conversion of the particular negative O, a process unknown to the older Logicians. By those, however, who employ the conversion by contraposition, both these moods may be ostensively reduced, the former to Ferio, the latter to Darii; and Archbishop Whately has expressed this by substituting the new terms, *Fakoro* for Baroko, and *Dokamo* for Bokardo; K being used to signify the conversion by contraposition of the premiss immediately preceding; e. g.

fAk All A is B.

O Some C is not B.

rO Some C is not A.

fE No not-B is A.

rI Some C is not-B.

O Some C is not A.

Reduction of Darii and Ferio.

Darii and Ferio are perfect moods, and therefore do not require to be reduced: but Aristotle has

observed, that they both admit of reduction per impossibile to the second figure, and so to the universal moods in the first figure, Barbara and Celarent; to which consequently all syllogisms whatever may be reduced: but this observation seems to be of little importance.

§. 7.

By inspection of the memorial lines, it will be readily perceived what propositions admit most readily of proof, and what of refutation: for instance, the universal affirmative A can be proved once only, and in the first figure; E can be proved once in the first figure, twice in the second, and once in the fourth, in all four times; I six times; viz. once in the first figure, three times in the third, and twice in the fourth; and O may be the conclusion of eight syllogisms; one in the first figure, two in the second, three in the third, and two in the fourth. On the contrary, A can be refuted,* by its contrary E, in four ways, and its contradictory O, in eight ways; E by its contrary A, once, and by its contradictory I, six times; I and O, by their contradictories only; the former in four ways, the latter only in one; so that, as a general rule, *universals and affirmatives are respectively less easy to establish, and more easy to overthrow, than particulars and negatives.*

CHAP. III.

SORITES, AND PROSYLLOGISM.

The proper province of the Logician is to analyze the modes of thought, rather than the forms in which they are expressed: but there are two condensed expressions of the syllogistic process, which deserve particular attention—the Sorites and Prosylogism.

Sorites.

When you have a series of Syllogisms in the first figure, in which the conclusion of each preceding syllogism is made the minor premiss of that which succeeds till you arrive at the ultimate conclusion, you may state this briefly by omitting all the minor premisses except the first, and all the conclusions except the last, expressing every one of the majors. The minor premiss of the first syllogism is generally placed first in order, and the final conclusion at the end; so that you will have a string of propositions, in all of which, with the exception of the last, the predicate of the former is the subject of that which immediately follows; thus, A is B, B is C, C is D, D is E, E is F, therefore A is F. This form is called *Sorites*,

from the Greek word *σωρός*, signifying a heap; and it may obviously be expanded into as many syllogisms as it contains major premisses; that is, *two less* than the *whole number of its propositions*. It is subject to the two following rules; the reason of which will at once be manifest by reference to the special rules of the first figure.

1. No propositions in the Sorites may be particular except the first and the last.

2. No proposition may be negative except the last two.

The syllogistic process by which we connect a lower with a higher class, is naturally expressed in this form, and indeed is the principal occasion on which it is employed; e. g. Thomas is a man, man is an animal, animal is a being, therefore Thomas is a being.

Prosyllogism.

When you advance a proposition either as the premiss of a syllogism, or otherwise, the truth of which is not immediately apparent, you may suggest, without detailing, its proof, by inserting in the body of it the middle term of the syllogism of which it is the conclusion: the term thus inserted is called *prosyllogism*. Thus in the proposition, A, *being* F, is B; F represents the whole argument of which A is B is the conclusion. In the pre-

misses of a syllogism *two* prosyllogisms only are admissible, one attached to the *middle*, the other to the *minor* term ; e. g.

B, *being* F, is A.

C, *being* G, is B.

And Aristotle has remarked, that the introduction of every prosyllogism, is a virtual addition of as many new conclusions as there are terms in the premisses, *except the one to which it is attached*. For instance, if we attach a prosyllogism to the minor term, we virtually add *two* new conclusions, connecting it with the major and with the middle ; thus,

B is A.

C, *being* F, is B.

Here you assume that C is F ; and cannot therefore make this the conclusion of a syllogism ; but you may readily form two syllogisms connecting in their conclusions F with B and A respectively ; e. g.

C is B.

B is A.

C is F.

F is B.

∴ F is B.

∴ F is A.

Chap. IV.

CHAP. IV.

INDUCTIVE SYLLOGISM.

§. 1.

The universal fact which every ~~deductive~~ inductive syllogism requires for its major premiss, cannot of course be arrived at by any process of deduction, but is the conclusion, in most cases^a, of a preceding act of *inductive* reasoning. This latter process furnishes, in every respect, a perfect converse of the former; for as we are obliged to ascertain the relation of a quality to a whole class, in order to be able to predicate it of any member contained under that class, so, it is evident, that we are not *formally* warranted in predicating an attribute of a whole class, unless we have before observed it to belong, or not belong, to *every one* of the

^a When the middle term of a deductive syllogism is a subaltern genus, it is evident that the minor may be a class-word, and the conclusion an universal proposition, and capable of being the major premiss in a new syllogism; but this will not extend to all cases.

members *of which that class is composed*: it is also clear, that as there are only two admissible major premisses in deductive syllogism, there will be two, and only two kinds, of inductive reasoning. The general form of these may be exhibited in the following figures, the former furnishing a major premiss to the moods Barbara and Darii, the latter to Celarent and Ferio.

x, y, z are B.	x, y, z are not B.
x, y, z are all A.	x, y, z are all A.
All A is B.	No A is B.

Each of these forms might at first sight be mistaken for a syllogism in *the third figure*, but a closer examination will immediately detect the following essential points of distinction. 1. Both of these syllogisms have an *universal* conclusion. 2. The common term with which the two extremes are compared in the premisses, is not, as in deductive reasoning, less extensive than the one, and more extensive than the other; but is *coextensive*, and *the same thing* with *the minor*; that is, is not a *middle term* in the sense required by the “dictum” *at all*. And, 3. The minor premiss is an affirmative proposition with its predicate *distributed*, a form impossible to any deductive proposition. If therefore these syllogisms are subjected to the rules of the deductive figures,

they are evidently *inconclusive*; it is impossible to prove any predicate to belong or not to belong to a whole class; and consequently the universality of the major premiss, (an essential condition of the first figure,) cannot be assumed except in *axioms* and *self-evident propositions*, and the validity of deductive reasoning in the majority of instances is overthrown. If, however, these syllogisms are, as they clearly are, conclusive, they are of a totally different kind from those which we have hitherto examined, and depend upon the following principle, which is the exact converse of that which we formerly established. “Whatever may be predicated affirmatively or negatively of *all the members* which together *constitute* a class, may be predicated in like manner of the whole class which is so constituted.”

The figures which have been described above, express the only two valid forms of induction, as in the following examples;

A	<u>This, this, and this magnet,</u> attract iron	x, y, z are B.
A	<u>This, this, and this magnet,</u> are (constitute) all magnets	} x, y, z are all A.
A	All magnets attract iron	
E	<u>This, this, and this animal,</u> are not immortal	x, y, z are not B.
A	<u>This, this, and this animal,</u> are all animals	x, y, z are all A.
E	No animals, are immortal	No A is B.

They are subject to the following rules :

The major premiss must be universal.

The conclusion must be universal.

The minor premiss must be an *inductive* proposition, i. e. an *affirmative* proposition with *both its terms distributed*.

§. 2. *Common principle, and rules, of all Syllogisms.*

It has been farther observed, by the eminent writer on Logic from whom this account of Induction is copied, that all syllogisms, inductive and deductive, agree in this respect; that the middle term (the term with which the extremes are compared in the premisses) is conceived as the consequent, or “determined” notion, in the major premiss, and as the antecedent, or determining notion, in the minor; and he has accordingly established the following principle, as the common law of all syllogisms, that “the *middle* term is the *determined* notion in the major, the *determining* notion in the minor, premiss.”

From this principle we deduce also the following rules, common to all syllogisms ;

1. The major premiss is universal.
2. The minor premiss is affirmative.

APPENDIX.

ARISTOTLE'S VIEWS ON INDUCTION.

The subject of Induction is treated by Aristotle, in the twenty-third chapter of his second book of Prior Analytics, in a manner for the most part accordant with the account which has been given above. He observes with respect to it, first, that in the minor premiss, the class must be predicated of *all its members*, and as composed of, or constituted by, them; secondly, that there is, strictly speaking, *no* middle term, in the sense in which the word is employed in inductive reasoning: and, thirdly, that induction is inferior in dignity to deduction, which is prior to it, in the mind of nature; that it is only required by our imperfection; and only useful in furnishing us with the major premiss of the deductive syllogism, or, as he expresses it, “Induction is the form of reasoning by which we prove the *major* of the *middle* term (i. e. those terms which are the major and middle in the deductive syllogism) by means of

the *minor*, (i. e. the individuals, which in deduction would be the minor term;) thus,

Induction.

x, y, z^3 are B^1 .

x, y, z are (*constitute*) all A^2 .

All A^2 is B^1 .

Deduction.

All A^2 is B^1 .

x, y, z^3 are (*come under*) A^2 .

x, y, z^3 are B^1 .

It is unfortunate, however, that Aristotle's love of system led him to observe, that if the minor premiss of the Inductive syllogism were simply converted, (as is warranted by the coextensiveness of the terms,) inductions would exhibit an apparent and formal though not *real* correspondence with deduction. By yielding to this temptation, he produced a perversion, which has been justly compared with the fourth figure of deductive syllogisms.

Inductive $\left\{ \begin{array}{l} x, y, z \text{ are } B. \\ A \text{ is } x, y, z. \end{array} \right. \quad B \text{ is } A. \quad (4\text{th figure.})$

Perversion. $\left\{ \begin{array}{l} x, y, z \text{ are } B. \\ A \text{ is } x, y, z. \end{array} \right. \quad A \text{ is } B.$

but which, in its consequences, occasioned far more serious evils: on the one hand, it led the philosopher himself to substitute for the true principle of induction, the following unmeaning law; “when two terms (B and A) may be predicated of a common third term (x, y, z) with which one of them (A) is simply convertible, the other (B) may be predicated of that which is so convertible:” and, on the other, it naturally produced the more serious error of later Logicians, who, observing their master’s anxiety to secure an unity of *form*, gradually overlooked the important distinctions which he had noted, and came at length to consider induction merely as a singular and interesting species of deduction, or even as containing no peculiarity worthy of observation except the accidental omission of a particular premiss in conversation or writing. Thus Aldrich, omitting all notice of the *negative* form, defines induction to be a syllogism in Barbara with the minor premiss suppressed; e. g. “this, this, and this magnet attract iron;” (this, this, and this magnet,—are, all magnets,) “all magnets—attract iron;” and Archbishop Whately, venturing upon a still wider deviation from Aristotle’s teaching, determines that the *major* premiss is suppressed, and exhibits the whole syllogism in the following form:

<u>(What is true of a, b, and c, is, true of all magnets.)</u>	
<u>That they attract iron</u>	is, <u>true of a, b, c.</u>
<u>That they attract iron,</u>	is, <u>true of all magnets.</u>

This account, however, entirely destroys the Logical existence of induction, as a form of reasoning distinct from, and prior to, deduction; and if there be, as we determined, a real correspondence and analogy between the synthetical and analytical process in each operation of the reason, it cannot be admitted. For it is evident that the syllogism exhibited above is an ordinary instance of the mood Barbara, and differs in no essential character from other examples of deduction: and lastly, it is so far from contributing any element of a new syllogism, that its conclusion cannot, by any Logical process, be made capable of acting as a major premiss to any perfect argument at all. The conclusion at which we wish to arrive, is the predication of a certain quality of the whole class, i. e. "All magnets attract iron;" and the formula, "what is true of a , b , c , is true of all magnets," is rather a statement of the *principle on which we assume* our premiss, than either of those premisses themselves. This part of the subject introduces us to the *metaphysical* difficulty which arises from the view of induction which has been laid down above. A Logical conclusion cannot assert

more than is virtually contained in its premisses ; that therefore which is predicated in the conclusion of a *whole class*, must have been assumed in the premisses of *every* member of which that class is composed : as *a matter of fact*, however, it is clear, that it is *scarcely ever* possible to ascertain *every member*, and in most cases, the number of cases which fall under our observation *bears no proportion* whatever to the whole. In these instances, therefore, it follows, either that induction is founded on a fallacy, and so all reasoning is overthrown ; or that there exists some primary law of thought by which we are justified in assuming a whole class, from a limited number of individuals. That the latter alternative is the true one, is attested by the tendency to form inductions, universally observed in mankind, a tendency, not derived from experience, but innate in us from childhood, and which experience does not increase, but rather checks, and renders cautious. The feelings of surprise, novelty, and disappointment, sufficiently attest the fact, that we are disposed beforehand always to expect the recurrence of the same associations which we have *once* observed. A child who believes the reality of all appearances, draws unhesitatingly an universal conclusion from every seeming fact which is presented to him ; and age restrains the tendency to

universalize, not by teaching us to require more facts than the child deemed necessary, but by rendering us more suspicious of the reality of single facts, and more cautious in examining them.

Now any principle which allows us to assume a whole class from *any* number *short of the whole*, must be founded upon an antecedent presumption that they are *all* governed by a common, immutable principle: for if a hundred objects were not believed to have any common law, and ninety-nine were found to agree, *this would form no presumption whatever of the hundredth*: and if they were, the observation of *one* would at once necessitate all the rest: it is therefore clear, that for a perfect induction, all that is required is the knowledge of a *single fact*: that if this one *be well* ascertained, we are allowed, or rather *compelled*, by a law of our nature, to assume the agreement of all other members of the same class, and that this law is derived from our *antecedent* belief in the immutability of all nature's operations. This statement at first sight appears a paradox: for it is universally allowed that no induction can be trusted which is not based upon an accurate and extended examination of facts: but the difficulty will immediately vanish, when we proceed to investigate the process by which the *mind is enabled to ascertain the fact*

from which her induction is derived; and the confusion of which, with the induction itself, is the principal fault of Archbishop Whately's major premiss.

To ascertain a *single fact* is far from being that easy task which beforehand we might expect: truth is never laid before us naked and palpable to observation; and even of those objects which are most familiar, the *real essence* is generally concealed under a load of accidental circumstances, which it requires great labour and patience to detect, and separate. According to the nature of the object-matter, there are two methods of arriving at the knowledge of facts. (1.) The former and more complete is by *direct* experiment, or analysis: it is pursued chiefly in physical science, and in all cases where the subject of investigation can be brought completely under our control. To illustrate in chemical science: two compound bodies are observed to produce flame, when united: the chemist wishes to know *what* has happened, of what law this is an instance; or which of all the qualities included in the two masses before him, were necessarily antecedents to the result which he witnessed: for this purpose he separates the two bodies into their component elements; and then taking one of each separately, tries if their combination

will produce flame a second time; those which do not, *he throws aside*; but *as soon as* he finds *some which do*, he immediately assumes his law, *not repeating the experiment*, unless he has some reason to suspect its perfect accuracy in the former case. It is evident that in this process he may assume several facts before he arrives at his final determination: but these are *not* several individuals coming under the same class, but members of different classes *examined* and *rejected*: and the *principle on which* they are rejected clearly implies the consequence of a *whole class* from a *single individual*: for instance, I observe a person, on drinking liquid from a certain cup, immediately expire. I at once suspect that this liquid occasioned his death: but, if I observe a second person drink of the same cup, without any fatal consequences, I retract my former opinion, and endeavour to find some other explanation: why? except that when I assumed that the liquid was poisonous in *one* case, I assumed also, and by necessary consequence, that it was *universally* poisonous. For this reason, all philosophy is said by Plato to begin by reasoning, ἀπὸ ἀρχῶν εἰς ἀρχάς, that is, from assumed principles or hypotheses, to *real* principles, by way of experiment.

(2.) But there are several kinds of facts which

do not admit of direct experiment, but elude our analysis: to this class belong *moral actions*, the principles of *taste*, and the like: we feel a thing to be right or wrong, beautiful or deformed; but although we are continually attempting to discover in what quality, or combination of qualities, the attribute we are sensible of resides; we are never able to penetrate its exact nature; but remain to the last in a state of partial ignorance. In these cases, we are obliged to be content with a mere *approximation to truth*: and the method of our investigation is exactly the converse of that which we pursued in the former instance, although implying *the same confidence* in the immutability of nature: before, from the ascertained reality of a fact, we assumed its universality; now, on the contrary, from observing the *general* connexion of two qualities, we assume that connexion to be *real*: the roughness, however, of our process, renders our assumption, to a certain extent, uncertain, and our conclusion *only general*.

Here then we *really* find *several facts of the same nature* employed for the purpose of ascertaining a *general rule or law*: but it is to be observed,

(1.) That this method is only resorted to in consequence of the impracticability of direct analysis; and never when the latter is possible.

(2.) That its force consists, not, as might be supposed, in authorizing us to infer the remaining instances of the same class, *which it does not*: but, in rendering it probable that the view which we take of the first instance is correct: it is only an imperfect and indirect examination of the individual, from which we intend to draw our induction: e. g. A's *obedience to his father* was right, (and that his obedience to his father *was* the quality in his act which made it right, is confirmed by the fact, that when B, and C, and D obeyed their parents, *they were right too*,) therefore, obedience to parents is *generally* right.

(3.) No *universal*, and therefore no *real*, principles can be gained in this manner, but only presumptive tests of the presence of a quality, still partially concealed; hence all practical principles are liable to exception; not that the *number* of our examples is insufficient; but that we cannot fully ascertain the *real* essence of the *one*; it is only in these cases that we talk of new instances strengthening or confirming the rule; because they give us more assurance of the correctness of our *first fact*: in a complete induction (for instance, the law of gravitation) *new examples add nothing* to our certainty.

It is certain, therefore, that between the induction of the vulgar and the educated, there is no

difference in the *mere Logical process*; both assume in their premisses the knowledge of all the members of a certain class, and both, upon the authority of a *real* or *supposed* individual fact: it is in the accuracy with which he perceives the true nature of this individual fact, that the distinction of the philosopher principally consists; and the developement in the mind of this accurate power of perception, is the main object of education. From what has been said above, it follows that education is a process of direct or indirect experiment; and it is to be observed, that this experiment consists in a series of *deductive conclusions from principles assumed upon the authority of others*. All knowledge is built upon *faith*, and the synthetic acts of reason, although antecedent to *independent* analysis, are themselves the result of a previous *dependent* analysis; thus the child forms its notion of the class *dog*, from *being taught* to call a certain number of objects by that name: and in the same way we arrive at principles of *our own*, by first taking for granted the principles of those to whose authority we are subject, and endeavouring to perceive their application in a number of particular instances: thus, if I wish to understand the principles of painting, I place myself under the direction of a perfect artist; and assuming, though *I cannot per-*

ceive, the truth of his principles, I test the goodness of every picture by its conformity or non-conformity to them. This is evidently a deductive syllogism; the *principle which I assume* being the major premiss; my *examination* of the object, constituting the minor; and my consequent *decision* with regard to it, the conclusion; e. g. if I am told that all figures having a certain curve are beautiful, (all A is B,) I examine whether this figure has that curve, (whether C is A,) and pronounce accordingly that it is or is not beautiful, (C is B, or C is *not* B :) when after a number of these acts, I am able to *perceive for myself* the connexion of A and B, in the individual case before me, I immediately proceed to my induction that *All A is B*, and from this principle now *made my own*, to deduce new conclusions, no longer as matters of *faith*, but of knowledge, and intuitive perception. This is the process described by Aristotle, (Eth. Nicom. lib. vi.) as the deductive ἐπιστήμη^a, by

^a "Οταν γάρ πως πιστεύη καὶ γνωρίμοι ὧσιν αὐτῷ αἱ ἀρχαὶ, ἐπίσταται. But this knowledge of the ἀρχή is distinguished from the *perception* of it (cap. 6.) τῆς ἀρχῆς τοῦ ἐπιστητοῦ, οὐκ ἂν ἐπιστήμη εἴη and εἰσὶν ἄρα ἀρχαὶ ἐξ ὧν ὁ συλλογισμὸς, ὧν οὐκ ἐστὶ συλλογισμὸς, ἐπαγωγή ἄρα and again, σοφία is distinguished from ἐπιστήμη, as being the perception of principles themselves, as well as of the deductions from them.

Δεῖ τὸν σοφὸν μὴ μόνον τὰ ἐκ τῶν ἀρχῶν εἰδῆναι, ἀλλὰ καὶ περὶ τὰς ἀρχὰς ἀληθεύειν. "Ωστ' εἴη ἂν ἡ σοφία νοῦς καὶ ἐπιστήμη, ὥσπερ κεφαλὴν

which we form the perfect *νοῦς*, or *power of induction*; and by Plato, (Sympos. p. 210, b. c.) as the education by which we are taught to understand *the one beautiful*, as the necessary antecedent to the perception of *the common law of beauty*^b.

This view of the subject furnishes an illustration of what was before observed, the tendency of the human mind to forget, or to neglect the true nature of Induction. Of this tendency, three explanations may be given.

1. The first and most obvious is the fact, that the actual process of induction occupies in each individual mind a comparatively insignificant position between two series of deductive reasoning; the former consisting of that education, by which, as we have seen, the knowledge necessary to induction was obtained; and the latter of the application of our principles when ascer-

ἔχουσα ἐπιστήμη. cf. I. Smith's Way of attaining Divine Knowledge, §. 21.

^b The same truth is implied in the lines of Hesiod quoted by Aristot. Eth. Nicom. i. 2. §. 7.

Οὗτος μὲν παναρίστος, ὃς αὐτὸς παντὰ νοήσῃ,
Ἐσθλὸς δ' αὖ καὶ κείνος ὃς εὖ εἰποντι πίθεται.

And it is to be observed, that Aristotle speaks of the knowledge of the *ὅτι*, not the *ἄτινα*, as necessary for acquiring that of the *δίότι*.

tained, to new conclusions. The act by which in the mind a fact becomes a principle, appears to be almost instantaneous; and as no principle is of practical utility except as leading to a particular conclusion, this would be an additional reason for its being overlooked by men in general.

2. To this may be added, the fondness of mankind for positive and systematic knowledge, and their impatience of any thing which reminds them of their imperfection. Hence Aristotle has observed, the superior popularity of the enthymeme to the example, in rhetorical arguments; and of proverbs, or maxims involving general principles, to enthymemes. Hence, also, it is mentioned by Plato, as the point of inferiority in *Mathematical*, to the higher branches of philosophical, study; and as their chief danger; that they start with certain general principles *hypothetically* assumed, and only spin out a continuous thread of conclusions, necessarily following from these principles *if granted*, but never leading in any manner to the proof of those principles. Plato Rep. vi. p. 511.

3. And lastly, it may be observed, that as *faith* is a necessary antecedent to all knowledge, so there are many subjects, especially to the mass of men, in which faith is *never* in *this world* superseded by knowledge, but continues the ground of our confidence to the end: in these cases, the impa-

tience of suspense, and desire for positive knowledge, naturally leads to the setting up of arbitrary standards, as the ground and test of truth: from this cause principally arise the heresies and schisms in religion: and to this, in many cases, the *perversion of a good principle*, is to be referred the almost superstitious reverence with which the authority of Aristotle gradually came to be treated by his followers in the middle ages. So absolute, at length, became the power which he exercised over the minds of men, that the “*ipse dixit*” was a sufficient answer to all objection or uncertainty; and the assertions of the master were regarded as sacred truths, which it became the scholars not to examine, but to assume as most undoubted principles, and foundations of their conclusions in all departments of science. The neglect of induction was the necessary consequence of this extravagant veneration; as a similar consequence resulted in religion, from the excessive authority of the Bishop of Rome: the philosophical revolution of Lord Bacon, which was contemporaneous with the Reformation, had its origin in the same cause, but was scarcely conducted, by him at least, with equal moderation. To balance the good or evil consequences, which have arisen from the publication of the *Novum Organon*, is foreign to our present enquiry; but it is to be

observed, that Bacon can in no light be considered as the author of the inductive method, which was understood both in its theory and application, by the philosophers whom he censures, and their most enlightened followers, as perfectly as by himself.

CHAP. V.

ENTHYMEME AND EXAMPLE.

§. 1. *Practical Syllogisms.*

LOGIC, strictly speaking, is not the only subject of Aristotle's *Organon*, which rather comprehends the instrumental sciences of those higher acts of the mind by which we arrive at probable or necessary truth, (*διαλεκτική* and *ἀποδεικτική*;) and may thus be considered as a sequel to the *Poetics* and *Rhetoric*^a. He has therefore introduced many subjects which are foreign to the province of the mere Logician; and this is the case with enthymeme and example. But, since his time, they have been inserted in all Logical treatises; and the misapprehensions which have arisen from this circumstance render a short account of their nature necessary.

Enthymeme and example are *practical* syllogisms; their province is to determine the weight

^a Ar. Anal. Pr. lib. i. c. 1. §. 1—3. c. iv. *Anal. Post.* and *Topic.* passim.

which certain facts ought to have as motives of action. Now this, if the nature of the subject were fully understood, would be simply a decision as to the Logical connexion of the terms: but there is no period of life at which the real essence of moral facts is fully apprehended by the human mind: we judge of facts, and draw conclusions, in practical matters, not by the pure intellect, but by the intellect and moral affections together. The degree of Logical probability required upon each occasion, varies, of course, with the nature of the subject and the character of the person concerned: to the young and inexperienced, affection is the principal and almost only guide; and although with the advance of age, practical principles acquire a greater stability, they never arrive at perfect certainty; and the influence of the affections, although daily more subordinate, is never entirely superseded. Practical arguments addressed to persons in whom feeling is still supreme, are distinguished as *rhetorical*; and to this class the forms we are now considering are sometimes referred; but their characteristics, as given by Aristotle, belong rather to the whole class than to any subdivision of it.

I. Enthymeme and example *agree* in the two following points of distinction from Logical syllogisms:

1. Their conclusions need not Logically follow from the premisses; but may even be admitted when a different consequent would be required by the strict laws of thought: as Bp. Butler has remarked, that we are often morally obliged to act when the Logical presumption is *against* our success.

2. In expressing them, one premiss is always and necessarily omitted; the hearer being supposed capable of supplying for himself that which the speaker intended, or the subject admits, *even though this should not be the same with that which the laws of Logic would require*. This distinction, which is consequently *real* and not merely *formal*, is grounded on the following reasons: (1) the necessity, in an argument intended to persuade, of reasoning from premisses known and acknowledged by the hearers: and (2) the fear of offending or wearying them by expressing that which they could have supplied for themselves. This applies especially to *rhetorical* reasoning, in which the audience are supposed to be comparatively weak and uneducated, and therefore require to be kept in good humour.

II. Enthymeme and example *differ* from each other, as corresponding respectively to Logical deduction and induction.

§. 2. *Enthymeme*^b.

You may deductively infer a fact either*from its accordance with a general law, or from the presence of another fact which usually accompanies it. (1) In the former case, the antecedent expressed is the *major premiss* which is related to its conclusion as a *general fact* to a *particular instance* of the *same kind*; its *subject* (the middle term) standing to the *subject* of the conclusion, in the relation of a whole to a part; and it is hence called in reference to the conclusion an *εἰκὸς* or *likelihood*. It is to be observed, that the *εἰκὸς* being a practical, and therefore only a general, principle, infers its conclusion not as a necessary but *probable* consequence. e. g.

Democracies¹ generally end in military
despotism:

(France is a Democracy):

∴ France will *probably* fall under the dominion of a military tyrant.

(2.) When the premiss, from which you draw your conclusion, is a fact, not necessarily bearing any resemblance to it, but generally observed to accompany it; it is called a *sign*, or *σημείον*. The *σημείον* is always a singular fact, and therefore a minor premiss, except in the third figure in

^b Ar. Anal. Pr. lib. ii. c. 29. Rhet. lib. i. c. 2. §. 16—19.

which it is always a major: it differs also from the *εἰκὸς*, in professing to deduce its conclusion (whether this be a general or a particular fact) necessarily and not probably only.

The *σημείον* may be related for its conclusion either as a particular to a general, or as a general to a particular.

I. *As a particular to a general.*

α. From knowing a quality to belong to an individual, you may infer that it belongs to the whole class of which that individual is a member. In this case the *σημείον* is the major premiss of a syllogism which would be expressed at length in the *third* figure, and its *subject* (the middle term) stands to the *subject* of the conclusion as a *part* to a *whole*. e. g.

Socrates is wise:

(*Socrates* is good):

∴ *All good men* are wise.

β. From knowing an individual to come under a certain species, you may infer that it possesses a quality which belongs to that species, or comes under the genus to which it is referred. The *σημείον* in this case is the minor premiss of a syllogism, which would be expressed in the *first* figure; and its *predicate* (the middle term) is

related to the *predicate* of the conclusion as a part to a whole. The reasoning in this instance is logically, as well as practically, conclusive; and its *σημείον* is consequently distinguished by Aristotle as *τεκμήριον*, or *certain* presumption; e. g.

(All men in fevers are ill.)

This man is in a fever.

∴ This man is ill.

(2.) *As a general to a particular.* From knowing an individual to belong to a certain genus, you may infer that it belongs to one particular species, amongst those which that genus contains. The *σημείον* in this case is the minor premiss of a syllogism in the *second* figure; and its *predicate* (the middle term) stands to the *predicate* of the conclusion as a *general* to a *particular*; e. g.

(All men in fever breathe hard.)

This man breathes hard.

∴ This man is in a fever.

It may be observed in confirmation of what was said with regard to the suppression of the premiss in practical reasoning, that a *mere Logician* would see no difference between the *σημεία* in the second and first figures; the distinction between them consisting, not in the premiss expressed by the

speaker, but in that supplied by the hearer, who is consequently supposed to know of himself, without being told (ἐνθυμεῖσθαι) the true connexion of the terms^c.

§. 3. *Example.*

The Argument from Example differs^d from Logical induction, in the two following particulars. (1) As all practical subjects are particulars, it always includes a deductive as well as an inductive process; its object being to establish the truth of a certain fact, as an instance of a general law.

(2) *This law* it inductively infers from a single fact, not Logically ascertained, but assumed with^e a greater or less degree of probability; or, as it is expressed by Aristotle, “Example is proving the *major* of the *middle* term, (not by the *minor*, but) by a term *of the same kind with the minor*: and it is required for this purpose that the *middle* should be known to be predicable of the *minor*,

^c This appears to be the meaning of the term ἐνθύμημα, which properly designates *all* practical reasoning; but, like συλλογισμός, is generally restricted by Aristotle to the *deductive* form.

^d Ar. Anal. Pr. lib. ix. c. 26. §. 5. τὸ παράδειγμα διαφέρει τῆς ἐπαγωγῆς, ὅτι ἡ ² μὲν ἐξ ἀπάντων τῶν ἄτομων τὸ ἄκρον ἐδείκνυεν ὑπάρχειν τῷ μέσῳ, καὶ ¹ πρὸς τὸ ἄκρον οὐ σύνηπτε τὸν συλλογισμὸν· τὸ δὲ καὶ συνάπτει ¹, καὶ οὐκ ἐξ ἀπάντων δείκνυσι².

and the *major* of the new term which is *like the minor*^e; e. g. I wish to infer that a particular line of policy (C) is dangerous (A), because founded on expediency (B): for this purpose I must first establish the principle, that all maxims of expediency are dangerous (All B is A): now I know that a certain measure well known to my hearers, and which notoriously led to evil results (is A), was recommended by its supporters on the plea of expediency (*is B*): *I assume therefore* that it was expediency which occasioned the evil consequences in this particular instance; *inductively* infer that it must be so in all cases (that all B is A); and proceed to deduce the conclusion which I had in view (C is A), as an instance of the principle which I have thus established. It is evident that the great distinction between this process and strict induction consists in the assumption of the fact from which the universal was inferred.

It is to this fact that the name of *Example* is strictly applied; it is generally the only part of the reasoning process, besides the conclusion, which is expressed; and is said by Aristotle to be related to its conclusion, "as a particular to a particular; both facts being instances of the same kind, but one better known than the other^f."

^e Ar. Anal. Pr. lib. ii. c. 26. §. 1.

^f Ar. Anal. Pr. lib. ii. c. 26. §. 4. and Rhet. i. 2. §. 19.

It is lastly to be observed, that two of the three *σημεῖα*, and the example, are always *Logically* inconclusive : but that they may be, and often are, in practical subjects, equally available and legitimate with the most rigid syllogistic form.

CHAP. VI.

HYPOTHETICAL SYLLOGISMS.

§. 1. *Hypothetical Propositions.*

Hypothetical syllogisms require one premiss to be hypothetical.

We have defined a hypothetical proposition to be *one which asserts the dependence of several propositions upon each other*: there are therefore *two* kinds of hypothetical propositions: for facts may be connected together.

(α) *Conjunctively*: i. e. the truth of one may depend upon the *truth* of the others; this is called a *conjunctive* (or sometimes *conditional*) proposition: it contains two and *only two* categorical propositions, that from which the other follows, and that which follows from it; the former is called the *antecedent* or *condition*; the latter, the *consequent* or *assertion*; and the relation subsisting between them is expressed by the particle "*If*" prefixed to the antecedent; as, *If* A is B, C is D.

It is to be observed, that the quantity or quality of the propositions separately, has nothing to do with the nature of their connexion: the propositions, If A is B, C is D: If A is *not* B, C is D: If A is C, C is *not* D: are equally *conjunctive*.

(β) *Disjunctively*: i. e. the truth of one may depend upon the other being *false*: this is called a *disjunctive* proposition; and the relation subsisting between its members is expressed by the particles, *Either, or*: e. g. *Either* A is B, *or* C is D. A disjunctive proposition may contain *several* categoricals; but in a syllogistic process they must be regarded as *two only*; e. g. if the proposition *Either* A is B, *or* C is D, *or* E is F, be employed as the premiss of a syllogism, two of its members must be regarded as *one*; as, *Either* A is B, *or* C is D, or E is F.

Again, as a disjunctive proposition states an *alternative*, i. e. not only that *one* of its members *must be true*, but also that *only one can* be true; you are warranted, if you have occasion, in changing the *quality* of *all* its members; e. g. *Either* A is B, *or* C is D; may be equally well expressed, *Either* A is *not* B, *or* C is *not* D.

Conversion of Hypothetical Propositions.

Hypothetical propositions admit of the following kinds of conversion or interchange.

(1.) A conjunctive proposition asserts the necessary consequence of one fact from another: it is evident therefore that if the consequent does not follow, the antecedent cannot have preceded; hence, *a conjunctive proposition may be converted by changing the quality of both its members*; e. g. If A is B, C is D, will be converted into, If C is not D, A is *not* B: If A is B, C is *not* D, into, If C is D, A is *not* B.

(2) Again, a conjunctive proposition may be expressed *disjunctively* by *changing the quality of the antecedent*. e. g. If A is B, C is D, may be expressed disjunctively, Either A is *not* B, or C is D.

(3) A disjunctive proposition contains, properly speaking, neither antecedent nor consequent; and the order in which its members are arranged is of no importance; it *does not* therefore *require* or *admit conversion*.

But a disjunctive proposition may be expressed *conjunctively*, by altering the quality of *one* of its members only. e. g. Either A is B, or C is D, may be conjunctively expressed; If A is *not* B, C is D; or, If A is B, C is *not* D; or, If C is D, A is *not* B; or, If C is *not* D, A is B.

§. 2. *Conjunctive Hypothetical Syllogisms.*

A conjunctive syllogism deduces a *categorical*

conclusion from a *conjunctive major premiss*. Now a conjunctive proposition has been shewn to assert the necessary consequence of one fact from another. It is evident, therefore, that if the antecedent *does* exist, the consequent *must* exist; and that if the consequent does *not* exist, the antecedent *cannot*; hence arise the two kinds of conjunctive syllogism, *constructive*, and *destructive*: the *former*, in the minor premiss affirming the antecedent, and so, in the conclusion, the consequent; the *latter*, in the minor premiss denying the consequent, and so, in the conclusion, the antecedent. e. g.

Constructive.

If A is B, C is D.

A is B :

∴ C is D.

Destructive.

If A is B, C is D.

C is not D :

∴ A is not B.

It must be remembered, that when I assert that one fact follows from another, I do not assert that it follows from that fact *only*; and consequently the *second* may exist when the first does not, or the *first* may not exist, when the second does. Hence it follows, that *no* conjunctive syllogism can be drawn from the *denial of the antecedent*, or from the *affirmation of the consequent*; and that the two which we have mentioned are, there-

fore, the only forms which can be legitimately employed.

The following *canons* contain respectively the *principle* of the correct, and a *caution* against the inadmissible forms, of conjunctive syllogism.

1. If the antecedent (or *condition*) be granted, the consequent (or *assertion*) must be granted.
2. If the consequent be denied, the antecedent must be denied.
3. No conclusion can be drawn, either from the affirmation of the consequent, or the denial of the antecedent.

No hypothetical syllogism admits of reduction to the figures of categorical reasoning. There is only one case in which we can, *not indeed reduce* the hypothetical syllogism, but gather from it a categorical syllogism with the same conclusion. This case is, when the antecedent and consequent have the *same subject*, and may therefore be considered as the minor premiss, and conclusion of a syllogism in the first or second figure. e. g. If *A* is *B*, *A* is *D*. By substituting, in such instances, the implied major premiss (*B* is *D*) for the hypothetical, we shall discover, that the error of denying the antecedent in the minor premiss of the conjunctive syllogism is analogous to a negative minor premiss in the first figure; and that of af-

firming the consequent to an undistributed middle in the second figure : e. g.

- | | |
|------------------------|--------------------|
| (1) If A is B, A is D. | B is D. |
| A is not B. | A is <i>not</i> B. |
| ∴ A is not D. | A is not D. |
| | |
| (2) If A is B, A is D. | B is D. |
| A is D. | A is D. |
| ∴ A is B. | A is B. |

A series of conjunctive syllogisms may evidently be expressed in the form of a *sorites*. e. g. If A is B, C is D ; If C is D, E is F ; If E is F, G is H ; with a conclusion, either constructive, as, A is B, ∴ G is H ; or destructive, as, G is *not* H, ∴ A is *not* B.

§. 3. *Disjunctive Syllogism.*

A disjunctive proposition, as we have said, *states an alternative*; i. e. that *one* of its members must be true, and *only one* can be true. When, therefore, you have a disjunctive major premiss, you may in the minor either *deny* one member, and so, in the conclusion, *affirm* the other; or, *affirm* one member in the minor, and so *deny* the other in the conclusion. The former

of these is called a *constructive*, the latter, a *destructive*, disjunctive syllogism. e. g.

(1) Either A is B, or C is D.

A is not B, or C is not D.

\therefore C is D. \therefore A is B.

(2) Either A is B, or C is D.

A is B, or C is D.

\therefore C is not D. \therefore A is not B.

It has been already remarked, that when there are more than two members in a disjunctive major premiss, several of these must be regarded as one in the syllogistic process. e. g.

Either A is B, or (C is D, or E is F.)

A is not B.

\therefore (C is D, or E is F.)

§. 4. *Dilemma.*

Dilemma is a syllogistic process, containing a *compound conjunctive major premiss*, and *disjunctive minor*.

Dilemma is either *simple* or *compound*: the *former* containing a conjunctive major premiss, with several antecedents and *one* consequent; or several consequents and *one* antecedent, and a

categorical conclusion; the *latter* containing a conjunctive major premiss with *several* antecedents and *several* consequents, and a *disjunctive conclusion*.

From the foregoing pages it will be clear, that the *truth* of a fact is most easily proved by shewing it to *follow from* an acknowledged truth, or to be the consequent of a true antecedent; and its *falsehood*, by shewing that it *implies the truth* of a proposition which is known not to be true, or is the antecedent of a false consequent. Upon this principle are founded the four kinds of dilemma.

1. For if I wish to prove that a fact not only *is actually* true, but would be true *any how*, or under any circumstances, I may do so by shewing, that it would equally follow from any case which can be supposed; or, logically, that it is equally a consequent from several antecedents, which are an alternative, and *one* of which, therefore, *must be true*. This, which is called a *simple constructive dilemma*, is stated in the following form.

$$\left. \begin{array}{l} \text{If A is B.} \\ \text{If E is F.} \end{array} \right\} \text{C is D.}$$

But either A is B, or C is D.

\therefore C is D.

2. If I wish to prove that a proposition would be *false* under *any circumstances*, I may do so by

shewing that it involves the assumption of *several* propositions which cannot be true at the same time ; or is the antecedent of *several* consequents, which are an alternative, and of which, therefore, *all cannot* be true ; this is called a *simple destructive dilemma*, and is stated in the following form.

If A is B, $\left\{ \begin{array}{l} \text{C is D.} \\ \text{E is F.} \end{array} \right.$

But either C is not D, or E is not F.

\therefore A is not B.

3, 4. When I wish to prove that *several* propositions either cannot be denied, or cannot be maintained, *at the same time*, I may do so by shewing them to be respectively, either consequents or antecedents of propositions constituting an alternative ; these forms, which are called *Compound Constructive* and *Destructive Dilemmas*, are expressed thus :

Compound $\left\{ \begin{array}{l} \text{If A is B, C is D.} \\ \text{Constructive. } \text{If E is F, G is H.} \end{array} \right.$

Either A is B, or E is F.

\therefore Either C is D, or G is H.

Compound $\left\{ \begin{array}{l} \text{If A is B, C is D.} \\ \text{Destructive. } \text{If E is F, G is H.} \end{array} \right.$

Either C is not D, or G is not H.

\therefore Either A is not B, or E is not F.

The various occasions upon which these forms of reasoning are adopted, as, when you wish to

entangle your adversary into one of several admissions equally unpalatable to him, to expose his inconsistency, or the like, will be suggested by the experience or reflexion of the reader.

§. 5. *Aristotle's account of Hypotheticals.*

In the twenty-second chapter, book 1. Pr. Anal. Aristotle formally divides Syllogisms into *Ostensive* (δεικτικοὶ) or *Categorical*, and *Hypothetical* (συλλογισμοὶ ἐξ ὑποθέσεως); and he proceeds to describe the nature of the latter in this and other passages, of which the most important are cap. 29, and 38, book i. and cap. 11. book ii. Pr. Anal. From his observations in these places the following account may be extracted.

When you either cannot, or do not wish to state the *direct* proof of any proposition, you may infer it *indirectly* from another fact to which it is known to be so related, that the truth or falsehood of the one necessarily involves that of the other. e. g. If I know that the truth of C is D, follows from that of A is B, (if A is B, C is D); I may infer the existence of the former (C is D), by syllogistically proving the latter (A is B). The name of *Hypothetical Syllogism* is given to the whole of this process, which evidently may be resolved into the two following parts.

1. *A proper syllogism*, having for its conclusion the proposition *from which we intend to infer* our original question; and which is therefore termed τὸ μεταλαμβανόμενον, that which is taken to be proved, *in the place of* the fact which it is our object to establish; ¹ ὁ μὲν συλλογισμὸς γίνεται πρὸς τὸ μεταλαμβανόμενον.

2. The *inference of the original question* from its *condition* thus syllogistically established; this latter (he proceeds) is *not a syllogistic process at all*; but depends either upon previous agreement, or some other relation supposed to exist between the propositions: ² τὸ δ' ἐξ ἀρχῆς περαινεται δ' ὁμολογίας, ἢ τινος ἄλλης ὑποθέσεως.

It is in the latter of these two processes that our hypothetical syllogism consists; and as the assertions which have been quoted are constantly repeated in the analytics, we are justified in drawing from them the two following conclusions respecting Aristotle's view of hypotheticals.

1. The process of inferring a categorical conclusion from a hypothetical premiss (our hypothetical syllogism) *is not regarded by Aristotle as a syllogistic process at all*: and it is therefore clear, that he neither understood nor recognized the existence of hypothetical syllogisms in the sense in which the word is used by subsequent Logicians.

2. The *sylogistic* part of Aristotle's συλλογισμὸς ἐξ ὑποθέσεως consists in proving one of the premisses of our *hypothetical*, by ordinary categorical reasoning. This premiss may be either the minor or major, though it is usually the *former*, as may be seen from the following instances.

1. α. If I wish to shew that "there is not one science of contraries," I assume (by agreement or otherwise) the conjunctive proposition; "If there is not one faculty of contraries, there is not one science;" (if A is B, C is D;) and syllogistically prove the truth of the *former*, (that there is no faculty, &c.) i. e. the minor premiss of a *constructive* conditional. Anal. Pr. i. 38.

β. If I wish to prove that men are not born perfect; I assume that "If they were born perfect, their characters could not be changed by habit:" (If A is B, C is D;) and syllogistically *prove the negative* of the latter, (characters *are* changed, &c. C is *not* D); i. e. the minor premiss of a *destructive* conditional.

2. In the *reductio per impossibile*, and all reasoning *ex absurdo*, in which the minor is supposed to be known, the syllogistic process of Aristotle seems to be the proof of the *major* premiss. e. g. I intend to prove that "the minor premiss in the first figure is affirmative;" and I know that "no term can be distributed in the conclusion

which was not distributed in its premiss:" now the *reductio ad absurdum* consists in proving *the alternative*, (that if the minor premiss be *not* affirmative, the major term will suffer illicit process,) i. e. the *major premiss* of the hypothetical syllogism. e. g.

Reductio ad absurdum.

Minor premiss being negative, &c.

∴ Illicit process of major term.

Hypothetical.

Either minor p. affirm:—or illicit process of major.

But there cannot be an illicit p. &c.

∴ Minor premiss is affirmative.

This syllogistic process Aristotle distinguishes as *abductio ad impossibile* (ἀπαγωγή εἰς τὸ ἀδυνατόν), from the hypothetical inference of the true conclusion, *per impossibile* (διὰ τοῦ ἀδύνατου), and generally, the συλλογισμὸς εἰς τὸ μεταλαμβανόμενον from the conclusion ἐξ ὑποθέσεως.

As it is clear, therefore, that Aristotle knew nothing of that which we call hypothetical syllogisms, his authority ought not to be quoted on either side, by those who contend upon the subject of the reducibility of hypotheticals to the categorical form. He has indeed asserted, that all

syllogisms whatever, *hypothetical* as well as *ostensive*, can be exhibited in one of the three figures; but he as distinctly explains himself to refer only to the *ostensive and direct* part of the hypothetical in this assertion, and expressly denies the possibility of reducing the *conditional* part. “You must not,” he says, “try to reduce the hypothetical syllogisms (to the figures): for as the terms stand, this cannot be done: they are not syllogistically proved, but established by the agreement of the disputants. For instance, if I assume, that *If there be not one faculty of contraries, there is not one science*: and then prove *that there is not one faculty*: I have not proved, though I have a right to infer, that *There is not one science*: this conclusion, therefore, cannot be exhibited in a figure, though the *former* (*There is not one faculty, &c.*) may; and in the same way, you cannot reduce the reduction *per impossibile* to the forms of the figures; though you may do so to the *abduction ad impossibile*; for the latter is the conclusion of a syllogism, but the former is arrived at by hypothesis only.” Ar. Pr. Anal. lib. i. c. 38.

THE END.

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ERRATA.

Page 4. line 8. note. *for seem read be seen*

- | | | |
|------|----------|----------------------------------------------------------------------------------------------------------------------------------|
| 28. | 13. | <i>for simple terms, adjectives read simple terms :
adjectives</i> |
| 30. | 24. | <i>for Cæsar conquered Pompey logically expressed
read Cæsar conquered Pompey is logically
expressed</i> |
| 36. | 2. | <i>for its several subjects read their several subjects</i> |
| 41. | 3. | <i>for predicables read predicates</i> |
| 50. | 11. | <i>for (p. 34.) read (p. 32.)</i> |
| 54. | 8. | <i>for sentient read "sentient"</i> |
| 58. | 9. | <i>for constructed read constituted</i> |
| 61. | 18. | <i>for the read their</i> |
| 62. | 8. note. | <i>for part read parts</i> |
| 63. | 6. note. | <i>for part read parts</i> |
| 69. | 28. | <i>for these read those</i> |
| 76. | 16. | <i>for No A is B, read No A is B. or,</i> |
| 82. | 2. | <i>for propositions as elements read propositions
only as &c.</i> |
| 83. | 3. | <i>for conversion read converse</i> |
| 86. | 24. | <i>for I read A</i> |
| 87. | 12. | <i>for contradictory oppositions as well as terms
read contradictory opposition of propositions,
as well as of terms</i> |
| 114. | 25. | <i>for premiss read premisses</i> |
| 120. | 1. | <i>for inductive read deductive</i> |
| 125. | 15. | <i>for inductions read induction</i> |
| 127. | 23. | <i>for premiss read premisses</i> |
| 149. | 11. | <i>for the others read the other</i> |
| 153. | 20. | <i>for consistent read considered</i> |
| 159. | 14. | <i>for δι' ὁμολογίας read δι' ὁμολογίας</i> |
| 161. | 22. | <i>for that read those</i> |

Et in vtraque de oratione
est difficilior pars quid
videtur. — Ac orator: XX

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